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LA 4921

THREE RIVERS, OTERO COUNTY, NEW MEXICO

A PROJECT OF EXCAVATION, STABILIZATION, AND
INTERPRETATION OF A PREHISTORIC VILLAGEStanley D. Bussey
Richard Kelly
Judith Southward

with appendices by

Tony Preslar
Glenn Hicks

A REPORT PREPARED FOR THE U.S. DEPARTMENT OF THE INTERIOR, BUREAU
OF LAND MANAGEMENT, LAS CRUCES DISTRICT, by the Cultural Resources
Management Division of the Department of Sociology and Anthropology,
New Mexico State University, Las Cruces, New Mexico.

December 1976

Report No. 69

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ABSTRACT

This is a report of the excavation, stabilization, reconstruction and interpretation of a portion of LA 4921, a prehistoric site near Three Rivers, New Mexico. The field work was accomplished by four archaeologists from the Cultural Resources Management Division of the Department of Sociology and Anthropology, New Mexico State University aided by approximately forty U.S. Youth Conservation Corps personnel. Field Work was conducted between 6 July and 11 August, 1976. The basic research goal was to obtain both scientific and recreational research information pertaining to the social organization, living environment, technology and subsistence of the prehistoric people who inhabited the site.

ACKNOWLEDGEMENTS

We wish to express our appreciation to the many individuals who helped to make this project a success. In terms of the cost investment this was a small project, but in terms of scope and approach, a very complex one, involving help and advice from a large number of people.

Kirby Kline, Y.C.C. Project Manager, BLM, Las Cruces District, whose idea this was, for planning, logistics, and breakfast, lunch, and dinner.

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Finally, and perhaps most important, we are indebted to the Camp Y.U.C.C.A. crew whose interest, initiative, and diligent work made this project a success. This report is dedicated to these individuals.

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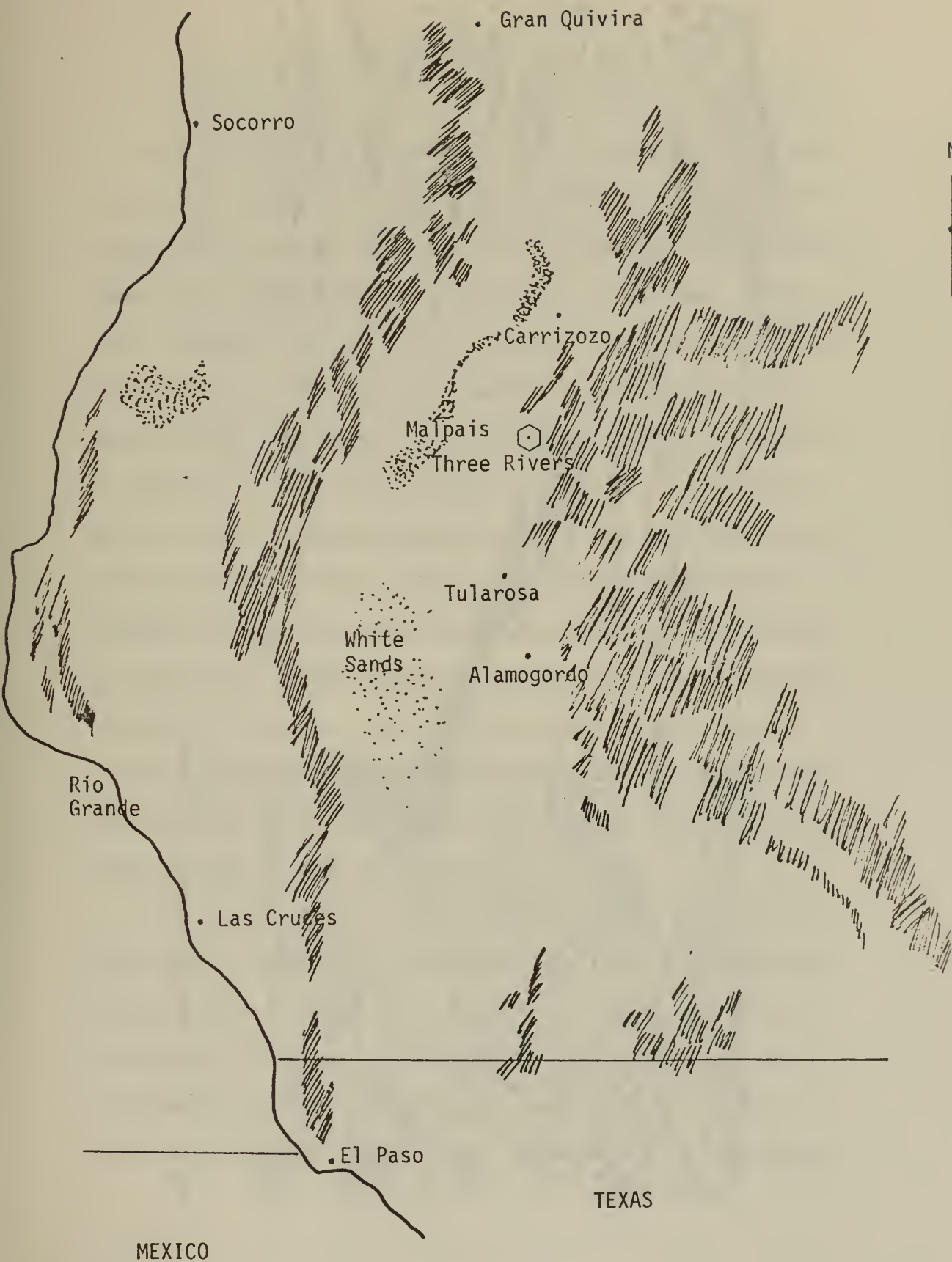
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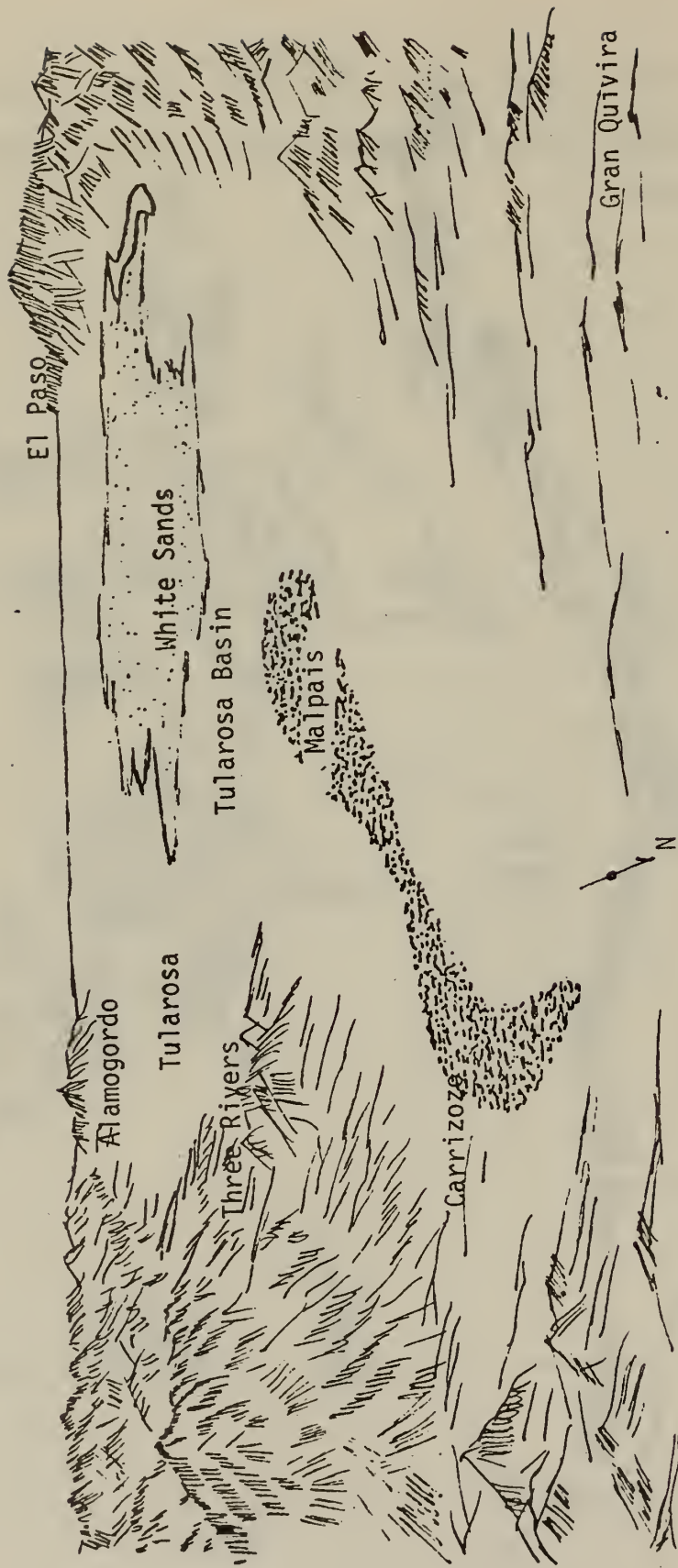
A photo-documentary was made during the field work. The areas to be excavated were photographed prior to disturbance and photographed again during the various stages of excavation. Over 300 photographs were taken, only a few of which appear here, the remainder are on file with the material from the site. The photographs were taken by Celina Garcia, Diane Ziegler and Richard Kelly.

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MAP 1. Location of Three Rivers Area



Map 2. Aerial Perspective of Site Area

INTRODUCTION

The idea for this project was first developed in 1971 by Kirby Kline, Outdoor Recreation Planner for the Bureau of Land Management, Las Cruces District, as a complement to the existing Three Rivers Petroglyph Recreation Area. In November, 1971, Kline discussed the project with Stanley D. Bussey, Department of Sociology and Anthropology, New Mexico State University. Bussey became interested in the project and submitted a proposal to excavate and stabilize portions of the site. The project was not funded, but both Kline and Bussey remained interested in the project. In 1973 Kline conceived the idea of using personnel of the U.S. Youth Conservation Corps in the project. In 1975, after it was determined that the project conformed to the goals of the YCC, active planning began. The Las Cruces District obtained funds to provide professional supervision of the work, and New Mexico State University was awarded the contract to provide that supervision.

The general objectives of this project were to provide a long-lasting recreational/educational facility in conjunction with the Three Rivers Petroglyph Site for public enjoyment; to extract prehistoric scientific data from the site; and to provide a worthwhile work-education experience for forty U.S. Youth Conservation Corps persons. The strictly archaeological

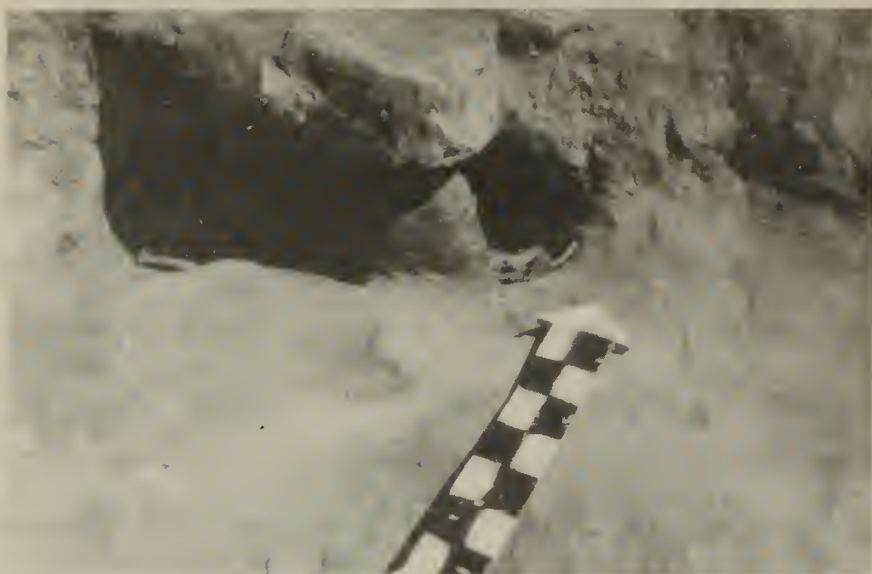


PHOTO 26. Burial - Infant -- Under bowl in Pit Room

The third burial, Specimen #68 was found in the south rectangular room in the adobe structure. It was found beneath the floor in the northeast corner of the room. It was flexed, face up.



PHOTO 27. Burial - Adult - Adobe Structure

objectives represented only one aspect of the total project. Successful completion of the project required the careful meshing of all aspects.

The use of a YCC crew involved two problems. The most crucial problem from the archaeological point of view was the question of whether the YCC crew would prove adequate for the task. On the other side of the coin, YCC goals had to be met -- the YCC personnel could not be treated simply as a labor force.

The YCC goals were met by training and using the YCC personnel in such a way that they not only understood what they were doing, but why they were doing it. The archaeological goals were met by providing this kind of training and by providing careful supervision during laboratory and field work. The staff treated the YCC participants as intelligent, responsible individuals and this was reflected in their work. The work done by the YCC participants was excellent, within the limits imposed by their ages and previous experience.

The meshing of recreational and scientific goals also created some problems. Recreational and budgetary requirements imposed the following limitations: (1) The excavation should be confined to a single block in order to restrict tourist impact on the remainder of the site; (2) Because of the cost of fencing, the area containing the excavated sites could be no larger than two acres; (3) Because of the time needed for fencing, the area had to be selected early in the project.

These limitations had some impact on the archaeological aspect of the project, especially the need to restrict the excavated area. The archaeologists wished to excavate the stone masonry structure (Area A), but they also wished to excavate several pit houses, and the area where pit houses were most likely to occur was several hundred feet from the stone masonry structure. Also, the archaeologists did not wish to decide on the area to be fenced until considerable testing had been done.

These conflicting goals, and some lesser problems, caused some friction at first, but the ranking personnel in the field, Kirby Kline (BLM) and Richard Kelly (NMSU), were able to reach compromises which, while not perfect from either point of view, were adequate to permit a successful conclusion to the project. The eventual compromise had the negative aspect (to the archaeologist) of limiting the size of the available sample, but the positive aspect of restricting the impact of future visitors to the excavated portions of the site.

The final negative aspect of the project was the small budget available. The budgeted amount covered the cost of field supervision, basic laboratory analysis and most of the cost of preparing the report. Unfortunately, the budget was not large enough to cover subsidiary studies: dating, floral and faunal analysis, shell analysis and comprehensive geological studies of pottery and stone tools. NMSU is seeking funds from other sources to complete these kinds of analyses.

The general prehistoric background of the Three Rivers area is presented later in this report. For the moment, suffice it to say that very little is known of the prehistory of this region. Even much of the basic framework--the sequence and dating of relevant time periods--is not based on local work, but on surmises derived from work in surrounding areas. For this reason, and because of sample limitations imposed by the nature of the project, the basic archaeological approach was to obtain information which could be used in better defining the basic framework of the prehistory of the Three Rivers area. This approach, which has been called the culture-historical approach (Willey and Phillips 1958:4) is basic to all of the more sophisticated aspects of modern archaeology. This project did not solve all of the problems of the local archaeology, but it did provide data and interpretations which have helped clarify the situation and which will aid future research.

The general approach to both the recreational and archaeological goals was to systematically excavate various structures to determine how they were originally constructed so that they could be reconstructed and to collect and record cultural material for analysis and interpretation.

LA 4291 In Context

In 1936 Emil Haury formally defined the Mogollon as a cultural entity distinct in many ways from the Anasazi of northern New Mexico. Haury's definition was based on a number of excavations between the Mimbres River and Glenwood, New Mexico. In 1948 Donald Lehmer defined a "Jornada Branch of the Mogollon" which was found east of Haury's Mimbres Branch Mogollon. Lehmer's original boundaries for the Jornada Branch (Lehmer 1948:10) enclosed a pear-shaped area with its apex a few miles north of Carrizozo, New Mexico, and its base a few miles south of Villa Ahumada, Chihuahua. The western boundary was roughly the eastern slopes of the Black Range and the eastern boundary, the eastern slopes of the Sacramento Mountains. Since then, the term has been applied generally to prehistoric groups in southeastern New Mexico who used brown utility pottery. Because of the relative lack of archaeological work in the "Jornada Mogollon" area, and because of the large area and the multitude of various sources of outside influence, the taxonomic relationships within the "Jornada Mogollon" are in a state of confusion.

In a major attempt to bring some order to this chaos, Marshall (1973:49-120) divided local variations within the "Jornada Mogollon" into regional Expressions, and summarized what was known of each. The major weakness of this system is Marshall's inclusion of Lehmer's "Northern" variant of his original Jornada Mogollon into the Lincoln Expression. In order to

avoid confusion within the Lincoln Expression, we will speak of a "Three Rivers Expression", which will include Lehmer's Capitan, Three Rivers and San Andres Phases. The Regional Expressions used in this report then, are the El Paso (Lehmer's southern variant), Three Rivers (Lehmer's northern variant), Lincoln East and Northeast (phases defined by Kelley 1966), Socorro (Mera) and Cedervale (Mera). It has been common practice to recognize three roughly equivalent phases in each Expression. These phases are based on architectural and ceramic development. In some Expressions this sequence is assumed rather than demonstrated. The early phase is characterized by pit houses and the late phase by surface structures, while the intermediate phase is transitional.

The Archaic or pre-pottery phase of the Jornada area is commonly called Hueco. It is assumed that the Jornada Mogollon is the product of indigeneous Hueco peoples who were able to acquire their first pottery from the Western Mogollon somewhat before 900 A.D. In the Three Rivers Expressions the Mesilla/Capitan phase is characterized by a locally made variant of Alma Plain that lasts through the succeeding two phases. The people in the first phase lived in pit house villages. Lehmer sees San Marcial as a focal point for the earliest distribution of Western Mogollon and Anasazi traits into the Jornada area. Mera's early surveys are based primarily on surface collections, and show that the San Marcial area is a very early focus of many

and varied ceramic intrusives, as well as a center of production of a very early painted white ware which is said to combine Anasazi and Mogollon characteristics. The most common intrusive in this first phase is Mimbres Boldface (Mangus) Black-on-White. However, later in the phase there begins to be manufacture and distribution of a locally made Terracotta ware with bold painted lines; San Andres Red-on-Terracotta. There are no excavated sites in the Three Rivers drainage of the Capitan Phase, but surface surveys have demonstrated that they do exist.

It is primarily from the intrusive pottery types that we examine the changes that occur in the Three Rivers Phase. In the early part of this phase, we still find Mimbres pottery (Mangus Black-on-White and Mimbres Black-on-White), but this seems to last only a short time before they are replaced by Chupadero Black-on-White as the dominant intrusive. It is possible that Chupadero Black-on-White was produced locally, since better than 20% of the sherds in our excavation were of this type. Another important intrusive in this phase is St. John's Polychrome from the White Mountain area of Arizona. Of the two structures we excavated, one was a rectangular masonry walled pit house and the other an adobe multi-room structure. Mimbres is lacking as an intrusive type. It is felt that both structures probably date at the transition from the Three Rivers Phase to the San Andres Phase. While the San Andres Phase is not well defined, the

assemblage recovered at Three Rivers does not seem to be typical of the San Andres Phase.

The San Andres Phase is characterized by El Paso Polychrome pottery and multi-room surface structures. El Paso Polychrome is found at LA 4921, but the status of the structures is open to some question. The El Paso Expression (southern) Jornada structures in the El Paso Phase are uniformly puddled adobe, as is the structure we excavated. However, as one goes further north or east in this same time period, the surface structures are often of stone masonry. In the last phase, there are no Mimbres intrusives; there are still intrusives from the White Mountain area and from Chupadera Mesa. Other intrusives found in the Jornada area are from southwestern New Mexico (the Animas Phase) and from northern Chihuahua. The El Paso/San Andres Phase is terminal; the extinction of the Mogollon in the Jornada area probably occurs about A.D. 1400. Historic Indians in this area are Chiricahua and Mescalero Apache, Janos, Jocomes, Mansos, and Sumos.

MOGOLLON

Jornada Branch

	Lehmer El Paso	Lehmer Three Rivers	Mera Socorro	Mera Cedarvale	Kelley Lincoln, NE	Kelley Glencoe
Period I	Mesilla	Capitan	San Marcial	-	-	Early Glencoe
Period II	Dona Ana	Three Rivers	Early Socorro	Cedarvale	Corona	Late Glencoe
Period III	El Paso	San Andres	Late Socorro	-	Lincoln	-

ILLUSTRATION 1. Jornada Branch Sequences

LIVING ENVIRONMENT

LA 4921 is located at an elevation of 5000 feet on the western slope of Sierra Blanca Mountain (12,003 feet), the highest point in southern New Mexico. It is north of Three Rivers Creek approximately one quarter of a mile, on the second of two benches bordering the creek. It is possible that the lower bench was formed in prehistoric times. The creek has a moderate gradient past the site and has water much of the year.

There are many natural resources in the area which were undoubtedly utilized by the prehistoric people. Clay deposits are widespread. Silicious rock, of poor to good quality, is found at higher elevations with relative frequency; among these, rhyolite is quite common. Various igneous rocks are found in the mountains or in the Malpais to the west. At lower elevations they can be found in stream cobbles.

Structural lumber such as beams or posts could be cut at slightly higher elevations or by the creek, and could be had as deadfall. The following discussion of topography, soil and climate is taken in large part from Agricultural Experiment Station Research Report 238, October 1972.

The topography to the east is a high mountainous and wooded area, rough and broken, including steep and very steep mountain slopes and canyons. Intermingled with the steep and very steep mountain slopes are gently to strongly sloping and

rolling uplands and ridge tops, as well as gently sloping to moderately steep valley bottoms. The mountainous foothills (starting at about 5500') area is dominated by rolling to hilly and steep topography. Similar gently sloping narrow valley bottoms and very steep canyon walls and escarpments also occur in the foothills areas (soils). Drainage west of these mountains is into the Tularosa interior or closed drainage basin.

LA 4921 is located in the Rockland-Nickel-Targo soil association which includes the dissected valley slopes and low ridges and hills that occur generally at the base of the steep mountainous uplands. Although geographically associated, the soils included in this general soil area are highly contrasting. They range from shallow soils developing over limestone, gypsum, or other sedimentary rocks to deep, gravelly and moderately textured soils forming in alluvium.

The land in this association is used for the production of native vegetation. Blue grama, black grama, dropseed spp., galleta, tobosa, bush muhly, three-awns, snakeweed, creosote bush, yucca, and chamisa are some of the more common plants. This association also supports thin scattered strands of juniper and some pinyon trees, particularly, adjacent to the mountain fronts at higher elevations.

The primary soils at the site are of the Holloman series. They are thin light colored strongly calcareous soils underlain by gypsiferous earth or gypsum at depths of 4 to 20 inches.

The excavated portion of the site is situated on a gypsiothermid bench that runs NW/SE. The site is separated from the Three Rivers creek by a bench that is composed primarily of Largo soil types and probably was cultivated by the prehistoric inhabitants of the site. To the north is a hilly outcrop of igneous rock on which have been carved hundreds of petroglyphs.

Climate

A wide range of climate exists in the site area because of the varied topography and wide range in altitude. The main source of moisture is the Gulf of Mexico, and moist air in the general circulation about the Bermuda high pressure area enters New Mexico from the southeast. This circulation is strongest in July through September, when the high pressure area is farthest west. Half the annual precipitation falls during this three month period. Precipitation generally increases with elevation, and the annual average of 8 to 10 inches in the Tularosa Basin increases to 25 to 30 inches in the mountains. Moisture from Pacific Ocean storms is greatly decreased by condensation over the mountains to the west, making winter the season of lighter precipitation. In summer, surface solar heating and upslope movement of the moist air result in frequent brief, but often heavy, afternoon thunderstorms, occasionally accompanied by hail. Average annual snowfall in the lower elevations ranges from 2 to 6 inches, and snow seldom stays on the ground for more than a day. At an

elevation of 6000 feet, average annual snowfall is about 2 feet; in the higher mountains, it is 6 feet or more. Mean annual temperatures decrease about 4 degrees for each 1000 foot increase in elevation. The steep rise of the foothills thereby causes quite large differences in both temperature and precipitation in short distances.

Sunshine is estimated to occur more than 75 percent of the possible hours in the Tularosa Basin, about 3500 hours a year, and about 60 percent of the possible hours in the mountains.

Typical of desert climates, relative humidities in the basin are low, usually ranging from 40 to 65 percent in the early morning hours and dropping to 15 to 25 percent on spring afternoons, and from 30 to 35 percent in summer. Because of the cooler temperatures, relative humidities are about 10 percent higher in the mountains. Winds in the basin average about 10 miles per hour, but are somewhat stronger in spring. Occasionally in late winter and spring the stronger winds cause considerable blowing dust. Most of the stronger winds are from the west or southwest.

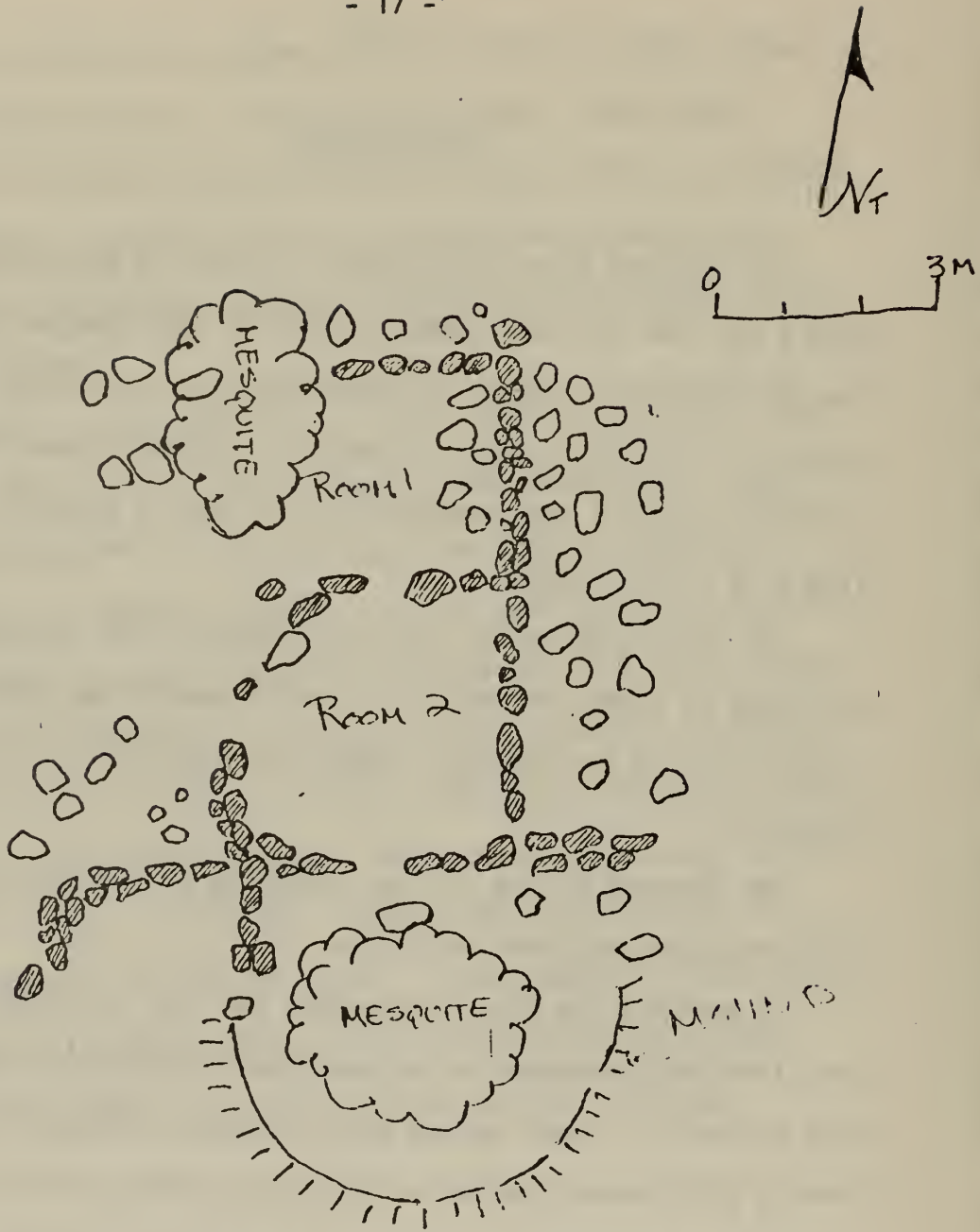
FIELD METHODS

Our research design was twofold. First, we had to excavate in such a way that we could literally "put it back together again". Two, we wanted as complete an understanding of the social organization, living environment technology, and subsistence of the prehistoric people who inhabited this village as could be derived from this limited sample.

The field work was to be accomplished by four archaeologists augmented by a crew of forty U.S. Youth Conservation Corps workers. We trained these inexperienced workers during the course of the excavation.

The contract called for the excavation of a multi-room surface structure and three pit houses.

We examined the site to determine the most favorable work area from the standpoint of archaeological research and recreation. Mark Wimberly of Human Systems Research made available to us his working copy (Wimberly and Rogers Mss.) of a recent survey of the Three Rivers drainage. It includes a very detailed description of four proveniences at LA 4921. We decided to excavate a stone masonry structure in the area defined by Human Systems Research as Provenience One. Gail Sharpe of Human Systems Research drew an illustration (Illustration 2) of the masonry structure from a map prepared by Michael Marshal. Bussey's and Kelly's inter-



Site B
Provenience

ILLUSTRATION 2. Masonry Structure - Prior to Excavation

pretation of the surface remains were the same as that of Marshal. We felt that it was a masonry surface pueblo. A photograph (Photo 1.) is included to show the structure after the vegetation was cleared and before excavation was begun.

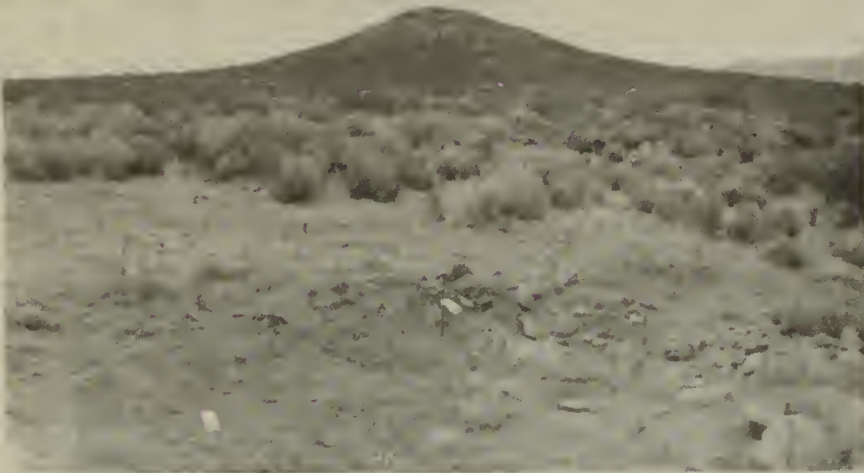


PHOTO 1. Masonry Structure - surface indication

We were constrained by recreational criteria to an area two acres in size. Because of the occupational patterns at the site, Provenience Two or Provenience Three would have been better areas to look for pithouses but they were too far from the masonry structure to be part of the same recreational exhibit.

There were some depressions and potholes in the area around Provenience One that we thought might be pithouses. Tony Preslar, a geophysicist and archaeologist, explored these depressions and other likely areas with a hydrogen proton magnetometer. He was able to identify six magnetic anomalies which appeared as negative magnetic susceptibility profiles.



PHOTO 2. Site on first day - Sierra Blanca in background

We tested these anomalies and identified two structures that were not apparent on the surface.

Provenience One was defined primarily by the presence of the masonry structure. The surface artifact density is low in this area. We felt that by starting our excavation with the masonry structure we could begin to train the Youth Conservation Corps personnel while we searched for pithouses. We anticipated that the areas of greater surface artifact density would be a more difficult problem for an inexperienced crew in the short time that we had. We felt that in Provenience Two or Provenience Three we might find pithouses superimposed on pithouses and encounter corresponding difficulties with horizontal control.

The area we chose to work in was photographed prior to disturbance. A trail was established into the area being careful to disturb the site and vegetation as little as possible. The trail was cleared of vegetation and lined with rock. Surface artifacts in the trail were thrown off to either side. An area north of the masonry structure was selected to dump backfill to check erosion. A rock wall was built to divert the water flow east of the site.



PHOTO 3. Magnetic Survey - Area of Adobe Structure

A crew was formed to do mapping. A permanent datum was established at the old road and trail intersection. A baseline was run 510' east (magnetic) through the site to an old ranch road. A grid of 20 foot squares was plotted over the work area and vertical control was established at each grid intersection. The mapping crew mapped the vegetation in the work area prior to its removal. Measurement was in feet and inches at the request of the BLM.

A field laboratory was established to process and catalogue incoming materials from the field. One individual was assigned the task of filling out all sacks and acting as a runner between the lab and field.

Lab personnel washed, sorted, stamped, catalogued and helped store the artifacts.

Because of the great number of local sherds, detailed analysis beyond the typological level was possible for only a sample of them. Samples from both floor fill and general fill were selected for examination. The samples were selected using a table of random numbers. Where possible, at least 10% of a sherd type was examined. All intrusive ceramic sherds were individually examined.

A representative sample of the flaked stone artifacts were sorted in the field and later analyzed in the laboratory.

All sherds and flaked stone were examined with a 20 power microscope. All the other artifacts mentioned in this report were individually examined.

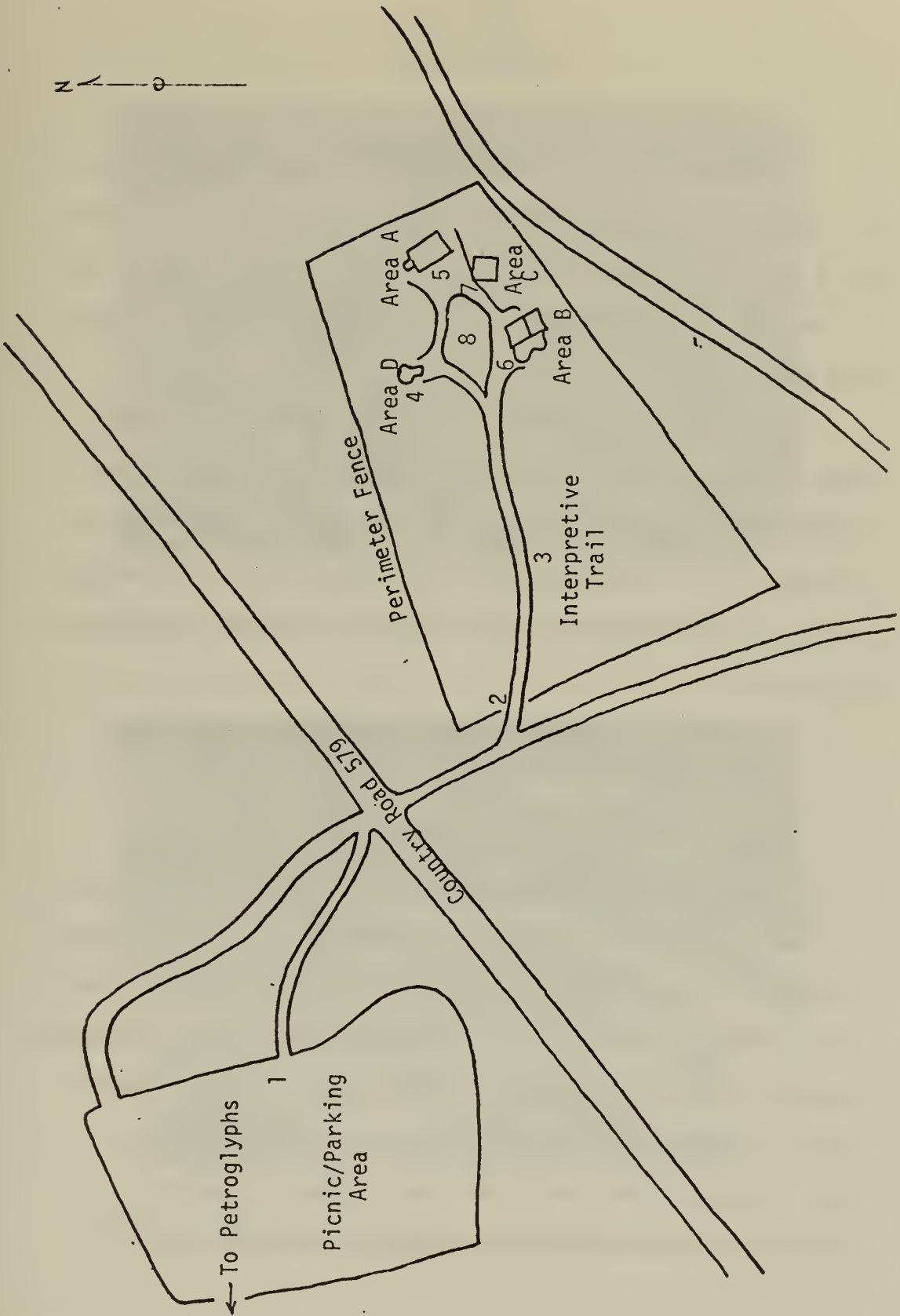
After the vegetation was cleared, a surface collection was performed. Excavation of the masonry structure was begun by troweling at arbitrary 0.5 foot levels. Test trenches were sunk at various locations around the structure and a sterile pit was excavated for reference. After the various strata were defined within a structure, the excavation proceeded by strata. Because the floors were in very poor condition, a result of pothunting, rodent activity and continual rain during the excavation, the floor was arbitrarily defined as that layer immediately above sterile soil. We recognized three strata in the masonry structure and six in the adobe structure.

A surface sheet midden approximately 10" to 20" deep covered the entire site, making it difficult to visually identify sub-surface architectural features. Post hole diggers were used to

test for pit houses by digging to sterile soil in the areas of defined magnetic anomalies or in areas which appeared, from surface indications, to contain pit houses. Quarter inch mesh screens were eventually used to screen general fill. A crew was formed to gather various samples: pollen, tree-ring, charcoal, floatation, etc.; a portion of these samples will be stored for analysis when funds become available.

Reconstruction was started in the middle of the third week, but some excavation continued on into the fourth week.

No pithouses of the early style were discovered in the study area, although at least one has been dug in another part of the site. In order to present a full range of structures, we constructed an early style pithouse in the study area.



Map 3. Architectural Map of Features and Areas

ARCHITECTURE

Four recognizable occupation/use areas were found and excavated during the project. These included a masonry structure (Area A), a multi-room, semi-subterranean adobe structure (Area B), an outside use area (Area C), and a group of interconnected storage pits (Area D).

In recording, each test pit or trench was given a feature number. Twenty-three features were formally excavated. Areas tested with the post hole digger were not given feature numbers if formal test pits were not dug at the same place. The feature numbers included in each structure (or use area) are listed below and on map 2.

Area A

Stone Masonry Structure

(Features 2, 3, 4, 7, 8, 10, 12, 13, 14, 18, 22 and 23)

Before excavation, Area A appeared to be multi-room surface structure of stone masonry. Part of the structure had been damaged by pothunters, but much of it remained undisturbed. However, excavation showed that it was a large, single room semi-subterranean structure utilizing several construction techniques. Photo 4 shows the rock as it was found. Photo 5 shows the structure as it was cleared and ready for reconstruction.



PHOTO 4. Masonry Structure - Work in progress



PHOTO 5. Masonry Structure - South Wall and Step

Construction began by excavating a large pit into the gypsum. The level floor ranged from 12 inches to 18 inches deep, depending on the elevation of the surrounding ground surface. Loose surface soil was scraped back from the edge of the pit and a rubble wall of roughly coursed rocks (cobbles and clasts) was built to a height of about two feet on the edge of the pit. Although much of the wall had collapsed, enough of the south wall remained to reconstruct it. The wall was a composite wall with an uncoursed rubble and mortar core between the faces. Occasional oblong blocks laid perpendicular to the axis helped bond the two faces. At the time of excavation, portions of the wall stood from 12 to 22 inches high. The rock recovered from the excavation was used in reconstruction, but there was only enough to raise the entire wall to a height of about two feet. Because of the size of the rock used, the degree of slope and the nature of the local erosional pattern, it is not likely that much rock was washed away. A number of possibilities remain. First, some of the rock may have been salvaged for use in later structures. This is very possible, but there is no real way to assess the probability. Second, the upper wall may have been made of coursed adobe. There was no evidence of much adobe in the house fill, but if they were using the local gypsum soil, it would not be distinguishable in the fill. Third, and most likely, is that the sides of the roof were brought down to the top of the rock wall in the manner of the early pit houses, giving what were essentially steeply slanting upper walls (See Illustrations).

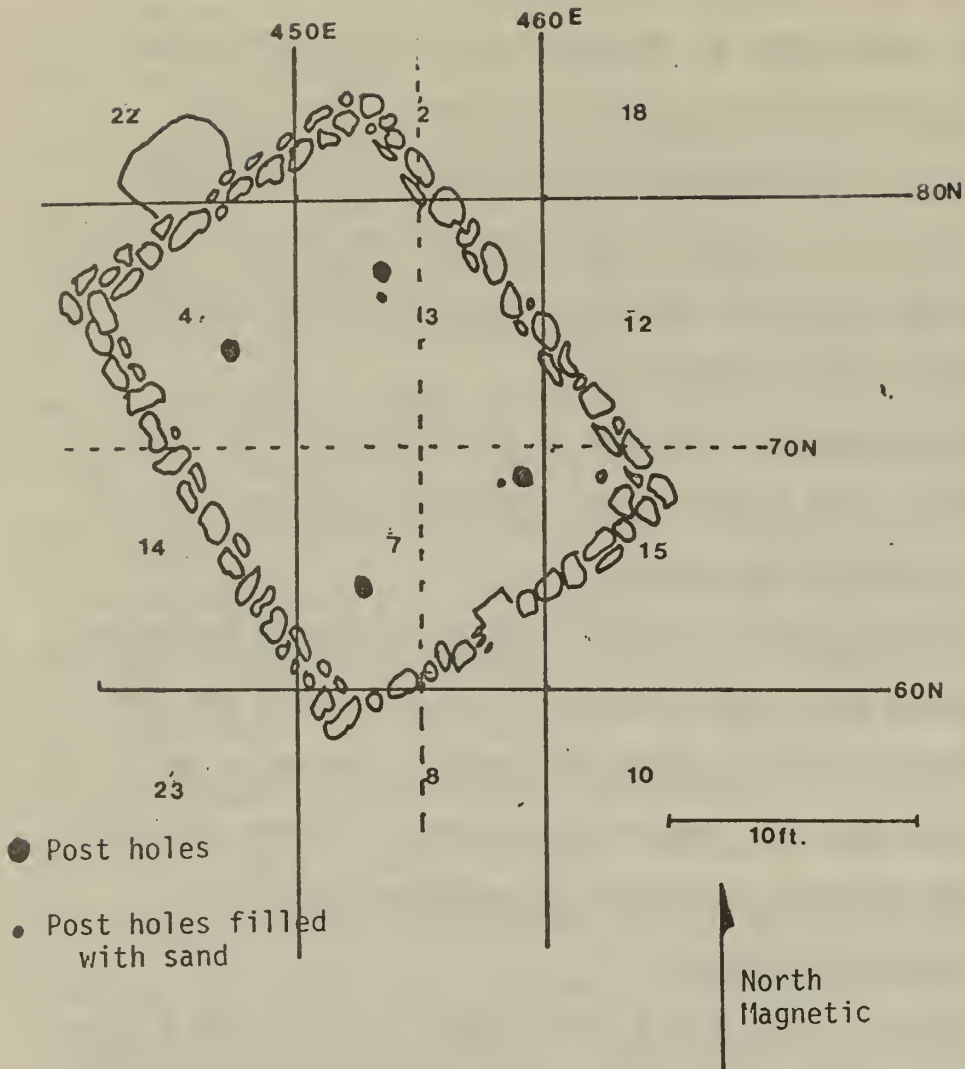
After construction of the main room, a semi-subterranean storage compartment was built outside the north wall. An entrance from the room to the compartment was made by tearing a hole in the north wall of the house. During stabilization, a beam was added for strength, but no such arrangement existed in the original wall.

Floor features are indicated in Illustration 3, the reconstructed wall cross section in Illustration 4, and the artist's reconstruction in Illustration 5.

There are no other excavated rectangular masonry pit houses in the Jornada area. The structure is also unusual in that the pit was excavated into a gypsum sub-stratum. Gypsum is not a good building material; when mixed with water it forms sulfuric acid, it has no particle size and is therefore difficult to stabilize and is very dusty.

The structure does have a south facing entrance with a step; this feature is common in the southeastern portion of the Jornada Mogollon area. Sites with adobe steps are the Sabine Mountain Site, the Hot Wells Site, the McGregor Site, the Escondida Site, and the Temporal Site.

Two and four post roof supports are common; this structure had four post supports and two small additional posts. The Temporal Site had a south step and four main posts; it is also similar in that the roof was burned. Abajo Del Cruz has a masonry room utilizing upright stone foundations and horizontal upper courses. It also had some rubble fill.



Masonry Structure - Feature A

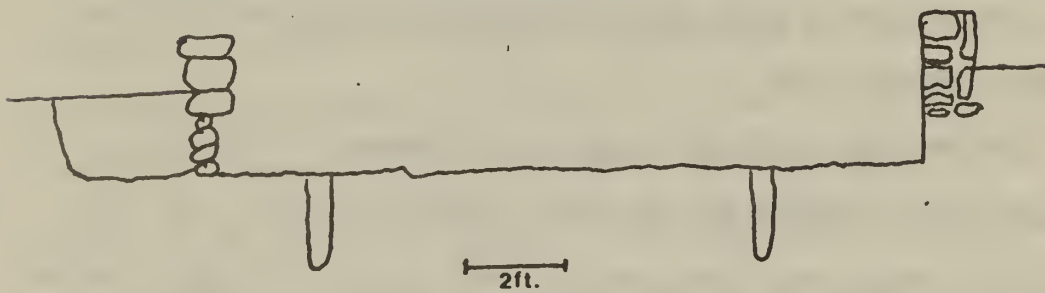
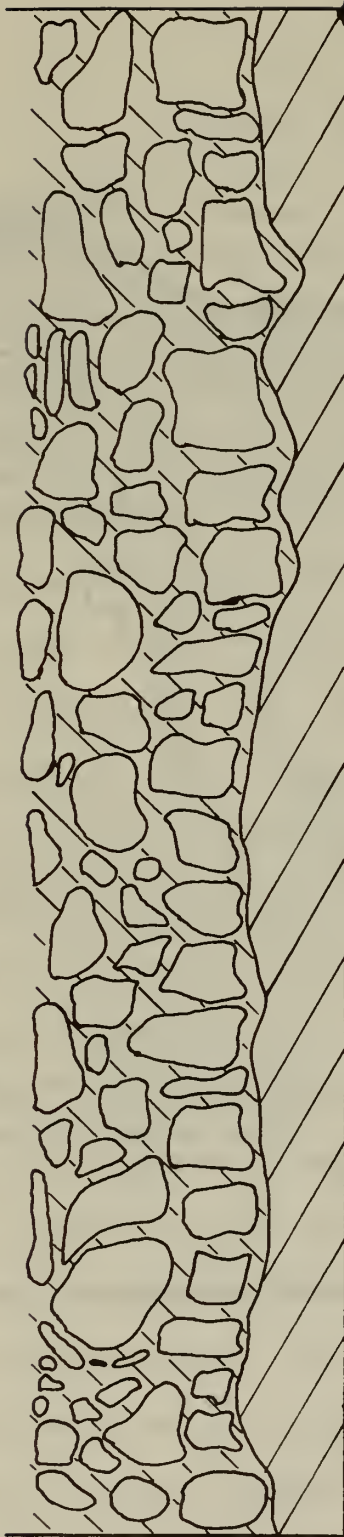


ILLUSTRATION 3



LA 4921

Stone Masonry Structure
Profile, East Wall



MORTAR



GYPSUM

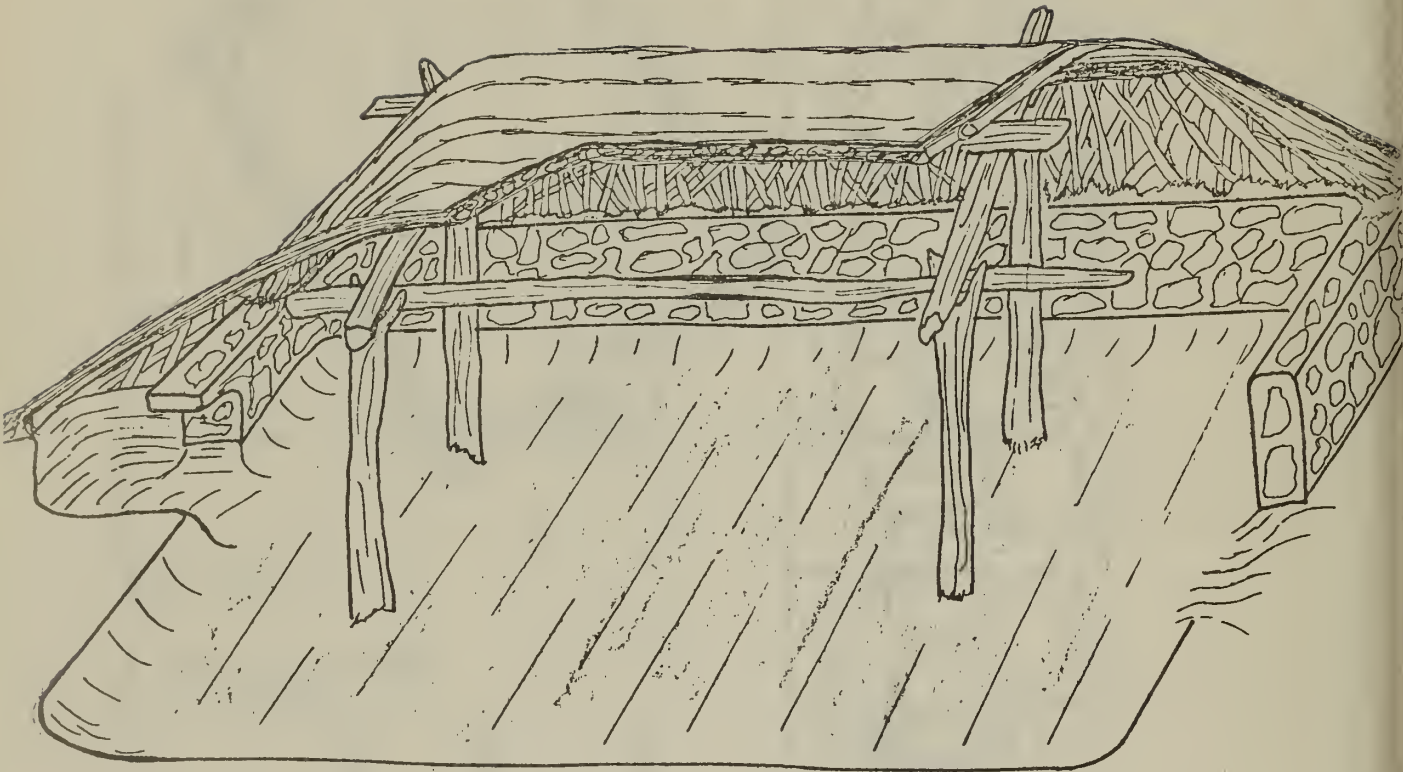


STONES

Scale



ILLUSTRATION 4. Masonry Structure - Reconstructed Wall Cross Section



LA 4921

Cutaway View, Reconstruction
Stone Masonry Structure

Scale
0 ——— 4
Feet

ILLUSTRATION 5. Masonry Structure - Artist's Reconstruction

Area B

Adobe Structure

(Features 6, 19A, 19B and 20)

The adobe structure was located as a magnetic anomaly during the magnetometer survey. Four rooms were discovered, three of which were excavated. Room 4 (Feature 20) was opened, but was backfilled because there was not time left to excavate and stabilize it.

A portion of the structure was semi-subterranean, but construction methods within the structure varied. The foundations of the walls of Rooms 1 (Feature 19A) and 2 (Feature 19B) were made by digging down into the gypsum layer to make a level (4 to 12 inches) and then building coursed adobe walls on this foundation. The walls in Room 3 (Feature 6) were considerably rougher. This room seems to have begun as a borrow pit. After it was no longer in use as a borrow pit, coursed adobe walls were built on top of the ground around the edges of the pit. The faces of the pit walls were left rough and unfinished. Floors in all of the rooms seem not to have been of prepared adobe, but of fill dirt thrown in and packed to a level surface.

Floor features are identified in the legend with the room maps (Illustration 6). All of the rooms contain hearths, and all probably were used as living rooms. Illustration 7 shows a cross section of the stratigraphy of the fill, and Illustration 8 is an artist's reconstruction. Photos 6 and 7 show work in progress.



PHOTO 6. Adobe Structure - Work in Progress



PHOTO 7. Adobe Structure - Work in Progress

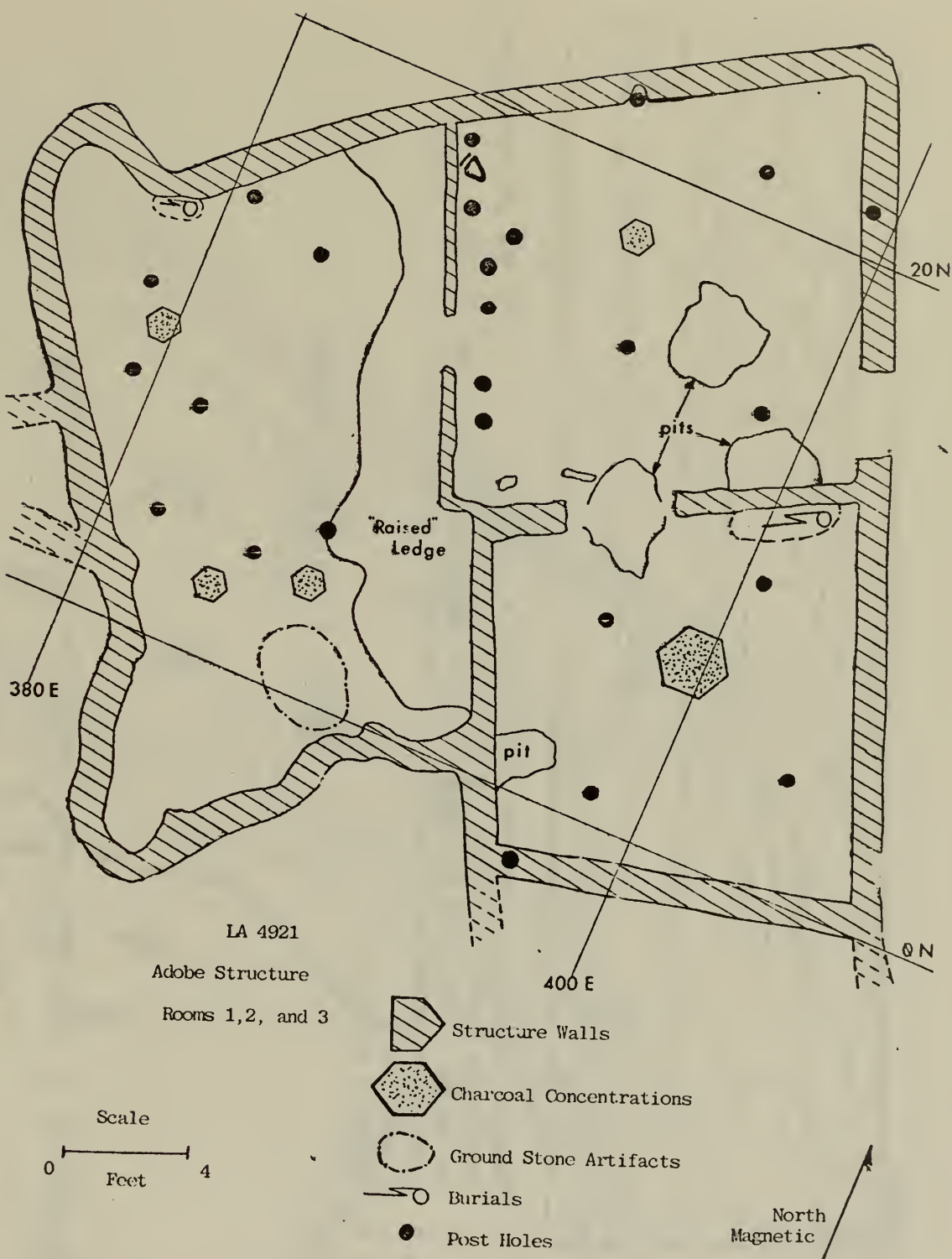
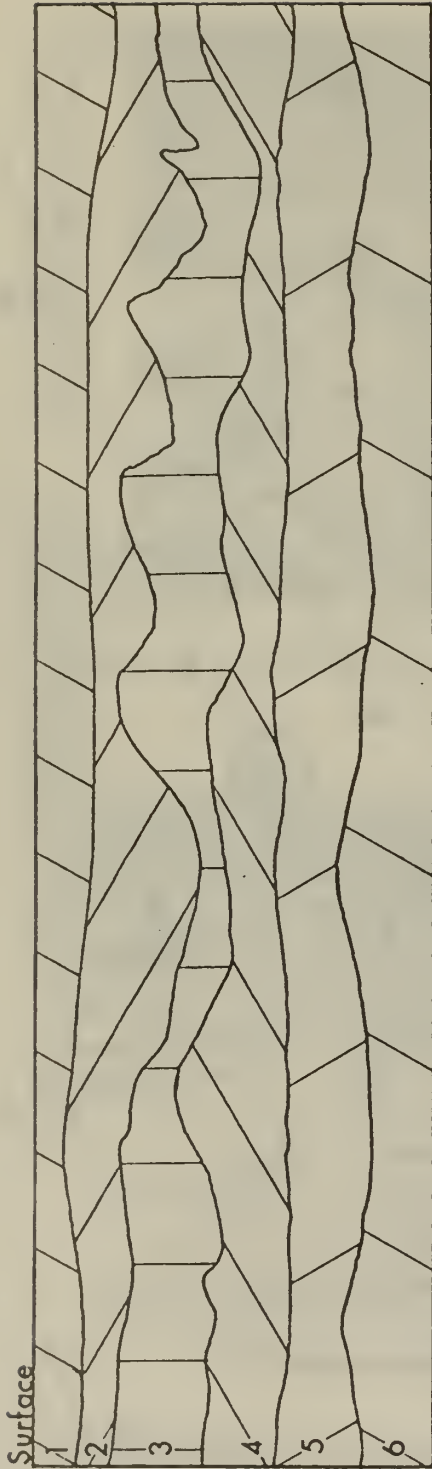


ILLUSTRATION 6. Adobe Structure - Area B



1. Reddish loamy sand - aeolian deposition
2. Hardpacked sand and gypsum - small amount of charcoal
3. Hardpacked gravel and gypsum - alluvium deposition - light root system
4. Softpacked gypsum and loamy sand - large amount of small roots
5. Floor fill
6. Gypsum - sterile

Feature 6 - Fill Stratification

ILLUSTRATION 7. Adobe Structure - Cross Section of Stratigraphy

LA 4921

Artists Reconstruction of

Adobe Structure

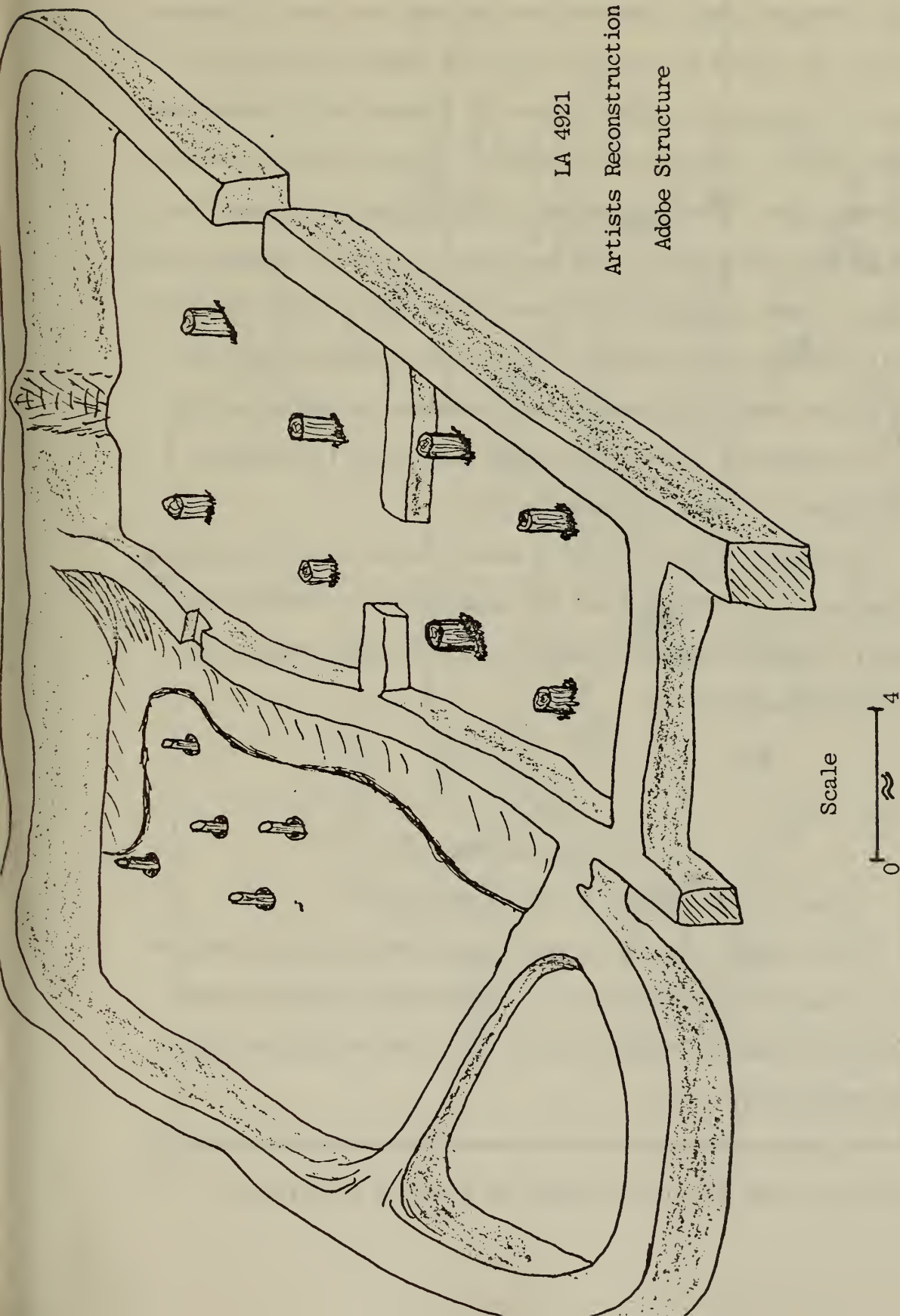


ILLUSTRATION 8. Adobe Structure - Artist's Reconstruction

Structures of puddled adobe are common in the Jornada Branch. It is a form of pueblo architecture that may have been introduced in the Dona Ana /Three Rivers Phase from the Middle Rio Grande by way of the Chupadero region or from the Mimbres or Chihuahua area (Kelley 1966). This structure seems to follow standard practice in being linear, however, the usual orientation is east-west and this is more north-south. The room block is usually grouped around a plaza. There is a possible plaza to the east of this structure, but it was not clearly defined. It does not seem that the walls were set on subsurface foundational footings, but rather on the sterile gypsum pit. One of the rooms had two wall entryways, a characteristic found at Abajo Del Cruz.

The Bonnell site (LA 612) is quite similar to this structure in the use of shared walls and the combination of pithouse concepts in conjunction with the idea of multi-roomed structures. (Kelley 1966:439-443).

Area C

Outside Use Area

(Features 5, 15, 16 and 17)

Area C appeared to be an outside use area, possibly sheltered by a bench ramada. No walls or roof-support postholes were found, but a number of burned beams indicated the possibility of some sort of brush roof.

The area appears not to have been a specialized use area, but to have been used for a number of kinds of activities.

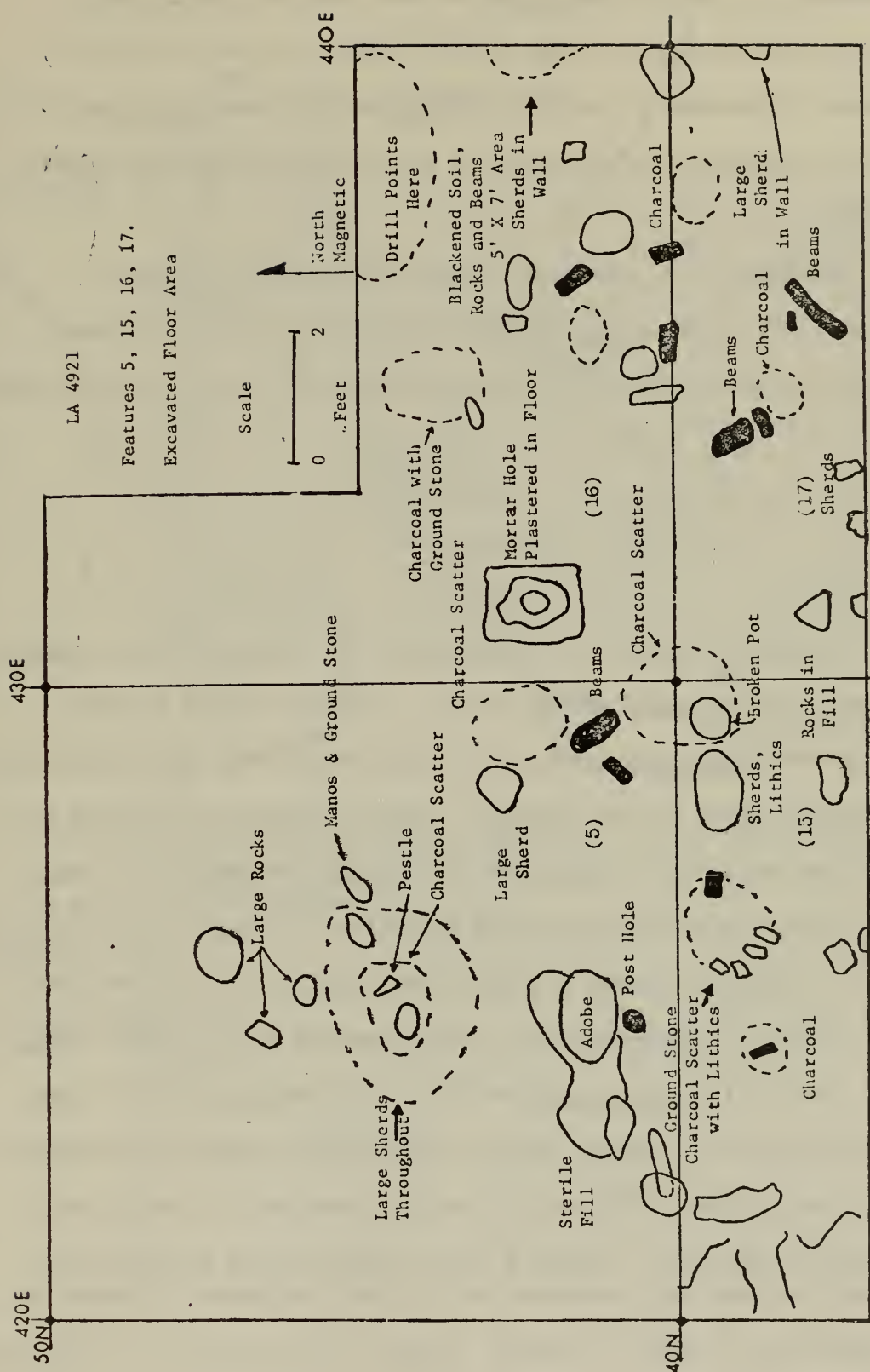


ILLUSTRATION 9. Outside Use Area - Area C

Evidence for use as a food preparation area included a mortar set into the original floor, several other grinding tools and pottery blackened by cooking. Activities not connected with food preparation are indicated by the presence of several stone drills.

Because of its ephemeral nature and depth below modern ground surface, Area C could not be stabilized and preserved. It was recorded and backfilled. Illustration 9 is a map of the area .

Area D

Storage Pits

Feature 21

The area containing the storage pits registered as a magnetic anomaly during magnetometer survey. Testing with the posthole digger indicated that sterile soil was only a few inches below the effective depth of the posthole digger in others. A trench into the area revealed a complex of three connected undercut storage pits and a depression which may have been an entrance (See Illustration 10). These structures probably were roofed when they were in use, but no evidence of the roofing remained in the gypsum soil.

The fill in and around the pits contained about fifty fragments of shell, a number of manos and metates, whole and fragmentary and a broken shist bar. A burial, Specimen #15, was found in one of the pits. Photos 8 and 9 show the pits as excavated. After the area was excavated the pits were expanded to become the representative early pit house.

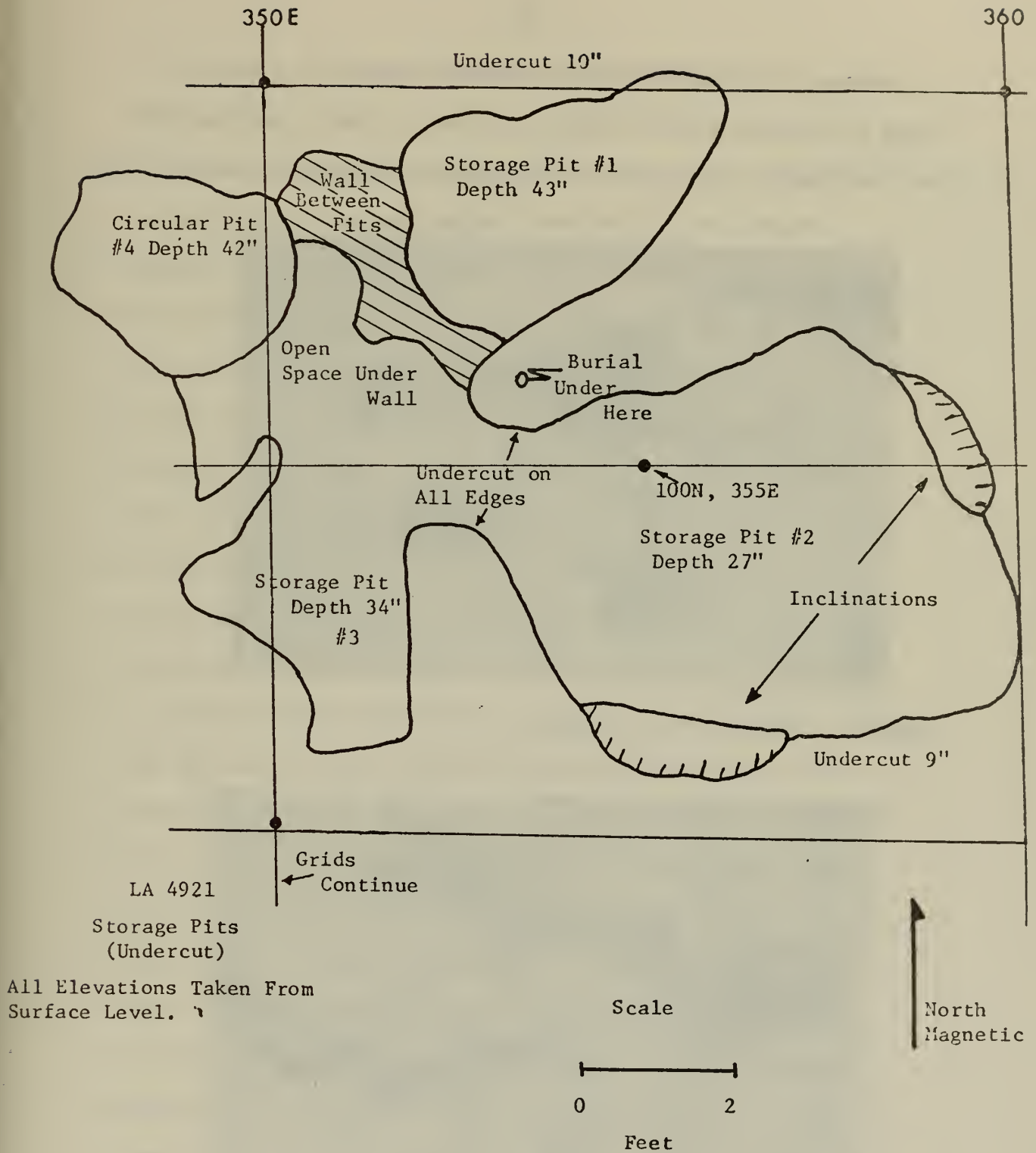


ILLUSTRATION 10. Storage Pits - Area D

Wiseman (1973) excavated bell shaped storage pits similar to these at the Bent Site (LA 10835); and two "slightly incurved-sided pits dug nearly a meter deep into sterile" at Abajo del Cruz (LA10832).



PHOTO 8. Storage pits - excavated

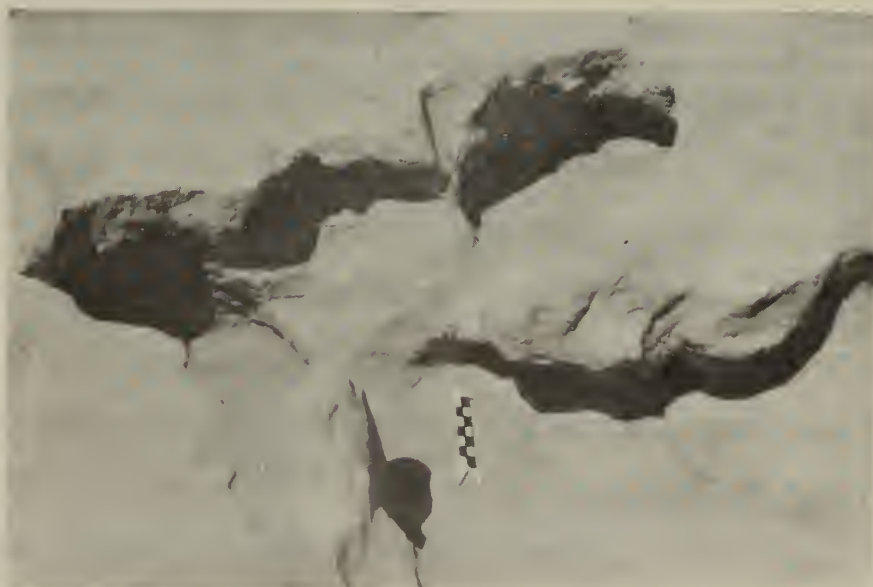
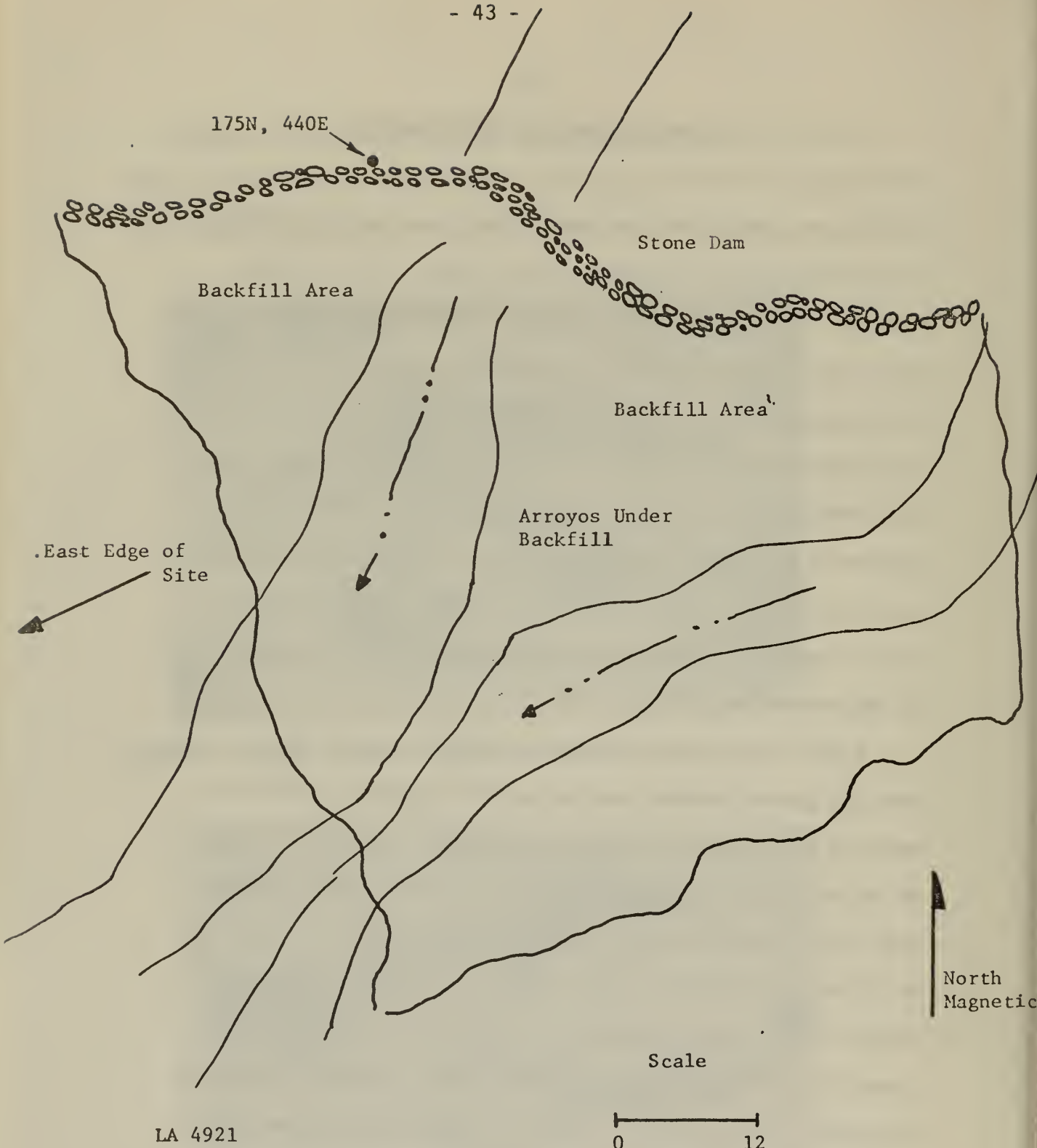


PHOTO 9. Storage pits - detail, arrow points to location of burial

STABILIZATION AND RECONSTRUCTION

The excavation was planned in such a way as to complement the stabilization and reconstruction effort. The site was examined in terms of likely areas for structures, proximity to the visitors parking area, visual setting and other factors. The masonry structure on the eastern periphery was chosen as the starting point, and a two acre area lying mainly west of it was identified as a likely area for additional structures. Because of the heavy traffic on the site during the excavation and the expected heavy traffic by tourists, every effort was made to reduce the disturbance to the prehistoric remains and to the present vegetation.

A trail system was designed to control traffic flow to and from the picnic/parking area during the excavation and afterwards to be used with interpretive signs by visitors to the site. An old ranch road bisects the site; it is from a point on this road that the trail begins. The permanent site datum is at the beginning of the trail. The trail is not too long, meandering through the mesquite and creosote, and avoiding areas of heavy concentration of artifacts or places where there were suspected structures. The trail is lined with rocks gathered from the creek a few miles to the east; no rocks were gathered from the site. Vegetation was cleared from the trail, and artifacts in the trail were moved off to either side. A four strand barbed-



Erosion Control of
Arroyos Threatening
Site

ILLUSTRATION 11. Backfill - Erosion Control

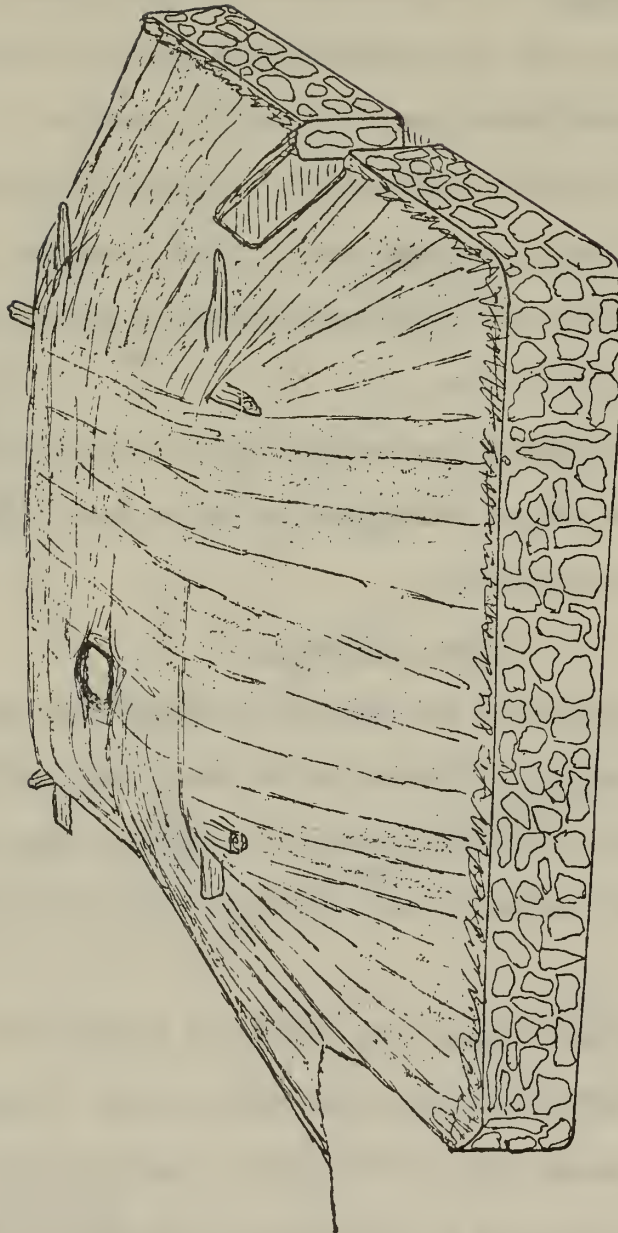
wire fence was constructed around the area containing the masonry structure and other suspected structures. The fence was designed to keep cattle out and people from leaving the site other than by the trail. There is no entrance on the western side near the beginning of the trail. It was determined to consolidate all the backfill in an arroyo that had washed across the site, thus stabilizing the masonry structure from further erosion. A rock wall was built against the backfill to channel the runoff water east of the site. The rocks were brought from the creek mentioned earlier. The work areas were graded to divert water away from the structures.

The contract called for reconstruction as close to the original as possible and we determined to use as much of the original materials as possible.

Masonry Structure

Only a small portion of the masonry structure remained intact. There was a good alignment on the south wall and the north wall was good on the west side of the storage compartment. A portion of the wall extended over the opening of the storage pit.

After the room was cleared and defined we started the reconstruction by laying the bottom course of stone. Some of these stones were set on edge on the sterile gypsum ledge; others were set in holes cut to the shape of the stone. Both an inner and an outer face were laid, occasionally a stone was



LA 4921

Artist's Reconstruction
Stone Masonry Structure

Scale
0 4
Feet

ILLUSTRATION 12. Masonry Structure - Artist's Reconstruction

set extending the width of the wall to tie the wall together. The width of the wall varied from 16 inches to 20 inches. The interior space was filled with rock, rubble and mortar.

The mortar we used was a mixture of clear gypsum soil backfill (2 parts), sharp sand (1 part), lime (1 part) and water with 4 oz. of cement bond added per gallon. After testing the existing mortar mixture it was found to foam under hydrochloric acid and it was therefore determined that some form of calcium carbonate was probably used as a binder with the gypsum. Because it would have been difficult and time consuming to collect sand, it was purchased locally from a cement company. The cement bond was used to give strength to the mortar mix and to protect it from water damage. Hydroplastic cement was used on the last stone course with lengths of steel reinforcing bar to form a structurally stronger bond and to protect against the elements and human traffic. (Illustration 12).

Rocks of various sizes were used, the smaller rocks being used to chink the larger. We had stockpiled all the rock from the excavation and used these exclusively until the last course as the rock was not enough to bring the wall above the present grade. I estimate that we added approximately 25% more than we excavated. It was also felt that this much could have been lost through erosion and borrowing for more recent structures or hearths. The top course of rock was kept flat and smooth anticipating the hard use it would get from visitors to the site. The original wall may have had post holes or a ledge along the top to

hold the roof beams extending from the center framework. Three kinds of rocks predominated: round washed cobbles, flat or squarish clasts, and shatter. Occasionally we would find a ground stone fragment in the wall.

Wooden beams were laid across the opening to the storage pit and the rock was set in hydroplastic mortar on it. Small rocks were laid around the perimeter of the storage pit to bring this above the current grade. There may or may not have been a rock wall around this pit when it was in use. No rocks were found in place and only a few small ones were found in the pit itself.

The four primary postholes were plugged with creosote posts and allowed to stand above the floor, thereby giving an indication of the structure to visitors. The floor was leveled with back-fill, sand and a little lime. This was necessary because the excavation was taken to sterile soil and there was much rodent burrowing at the floor level. The entrance step was capped with hydroplastic cement and reinforced with steel reinforcing rod. The entire structure was sprayed with masonriseal. This product is a water miscible, siloxane anti-capillary used to prevent erosion and aid in abrasion contact. The floor was sprayed two feet out from the walls, the remainder being left to absorb and drain water.



PHOTO 10. Masonry Structure - Reconstructed

Adobe Structure

After clearing and defining the two rectangular rooms and the contiguous pit room, we started the reconstruction by laying the first course of puddled adobe. This first course was found to contain too much clay and had to be removed. The starting ratio was 4 parts clean backfill and 1 part clay; however this was changed to 5 parts backfill and 1 part clay. Cement bond was used in the first and second course but was too expensive to repurchase. A small amount of plasterers' lime was added at the rate of two shovel-fulls for every wheelbarrow load of clay. The mixture was prepared by making large "volcanos" that were filled with water and mixed with hoes and shovels to a doughy consistency. As there was insufficient time and manpower to gather the adobe at the site, clay was purchased from an adobe company at La Luz, New Mexico.

The adobe mix was shovelled on to the existing wall and hand formed into place. This was not a difficult task and it was possible to get good smooth vertical walls as long as the lower course was allowed to set up before another was added. The average height of a course was about 3 inches to 4 inches. The courses were laid around the structure in a spiral fasion. As we came back to the starting point that portion was set up and we could start over. The following day we took round cobbles 3 inches or 4 inches in diameter and pounded the wall to make it smooth and straight and to compact it and obliterate shrinkage cracks.

The walls were rebuilt to a height slightly above the present grade. We were not able to determine the height of the walls, but we did not feel that they were as tall as the top of the roof. It is likely that the walls supported beams radiating from the center four-post superstructure. The postholes were plugged with creosoted wood posts and allowed to stand above the floor thereby giving an indication of the structure to visitors. The floor was leveled with backfill and sand. The entrance was protected by two posts at each side and the area graded to prevent water from washing in. After two weeks of curing , the entire structure was sprayed with masonriseal two feet out from the walls, the remainder being left to absorb and drain water. (See Illustration 8).



PHOTO 11. Adobe Structure - Reconstructed



PHOTO 12. Adobe Structure - Reconstructed

Pit House

After an intensive search produced no pithouses it was decided to create one in the area in which the storage pits were excavated.

We excavated a squarish hole with round corners about 15 feet 7 inches north/south by 12 feet east/west and 30 inches deep. A ramp entrance was excavated with southern orientation; there is a step into the ramp and a step at the end of the ramp into the room. Four postholes were dug and forked posts installed and levelled. Beams were placed between the forks and others were laid over these to form a smoke hole and form a support for the beams radiating to the circumference of the pit. Long poles or beams were set in holes dug around the exterior top of the pit and rested against the center framework; others were laid in place to fill out the framework. See Illustration 13.

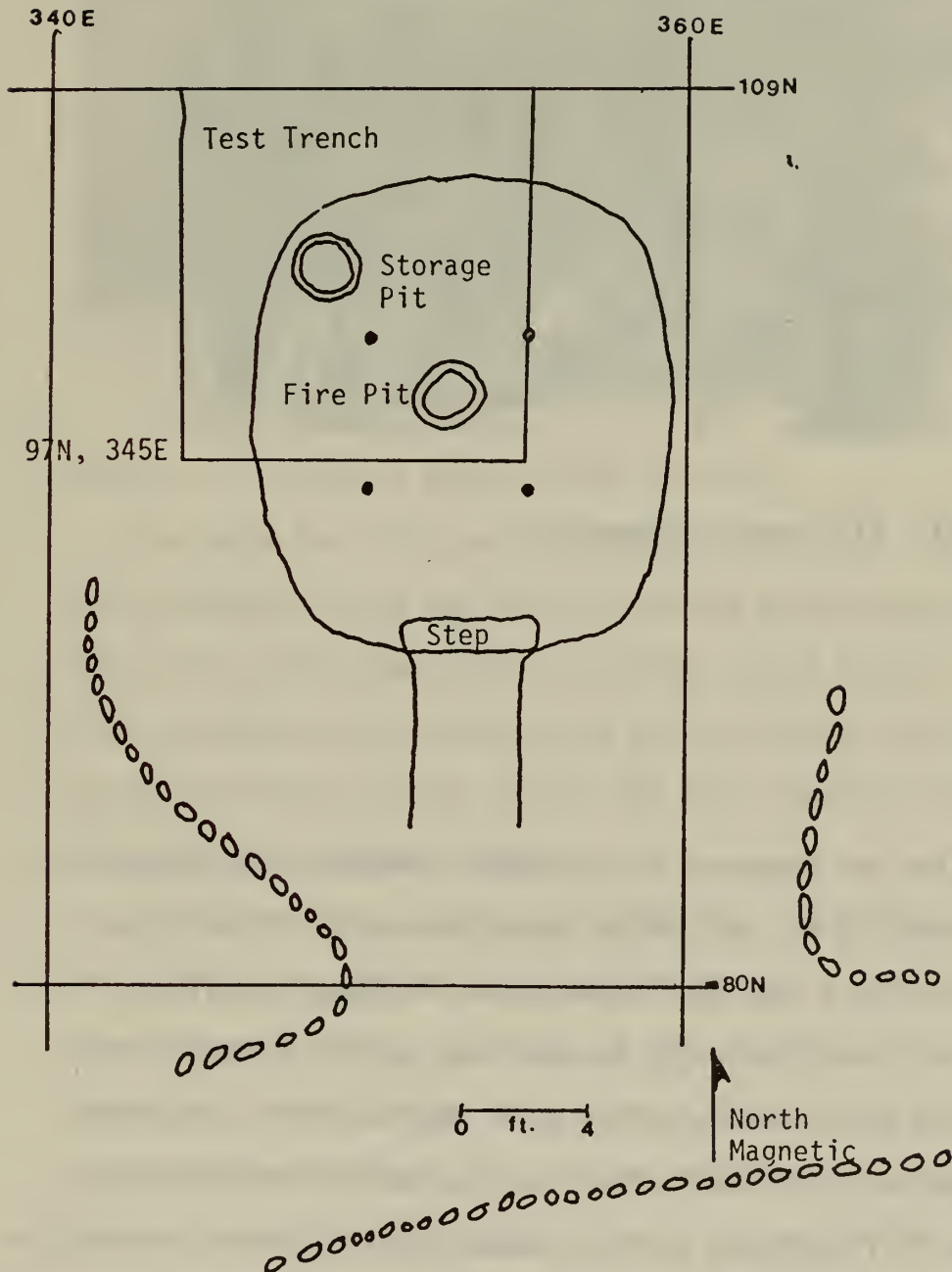


ILLUSTRATION 13.
Pithouse Floor Plan



PHOTO 13. Pit House - Framework

After the framework was completed the adobe was prepared in same manner as for the puddled adobe structure. Tules or cattails were laid over the framework, and the adobe was placed over them, thus preventing the mud from falling through. The adobe was laid from the bottom up on the exterior. As a course of adobe was laid, small sticks were poked into the course to further fill the holes in the framework and hold the tules in place. Some adobe was placed around the base of the framework on the interior to hold the posts in place and to add structural strength.



PHOTO 14. Pit House - Brush and Mud Covering

The adobe was first applied approximately three inches thick; another coating two inches thick was added two days later. Additional patching was done as shrinkage cracks appeared. After the adobe had a chance to set up to a plastic state it was pounded with round cobbles to bind the adobe together and to obliterate the shrinkage cracks.

Loose sticks and tules were pulled from the interior and the interior was sprayed with penachlorophenol, a wood preservative and insect toxin. A portion of the previously excavated storage pit extended below the pit house floor in the northwest corner of the pit house. This pit was modified and plastered and became a storage pit for the pit house. We constructed a small fire pit in the center of the floor and lined it with adobe.

After the structure had set up for two weeks the exterior was sprayed with a solution of masonriseal to prevent erosion.

We were aided in our stabilization effort by the help and advice of Elger Stauber and Cheryl Ferguson of the BLM Stabilization Team from Santa Fe. They provided us with the results from their research in past projects, visited the site and offered many helpful ideas. On their second visit to the site, they took soil samples from the backfill and applied various stabilization mixes to them. These samples were left out in the weather to test the stabilization mixes.

The greatest difficulty in preserving the reconstructed site is water damage. For this reason sufficient drainage must be maintained around and within the structures. It would be advisable to roof or in some way cover the two open structures.

It will be necessary to review the condition of the structures yearly. Cracks and loose rocks should be repaired whenever necessary. The adobe and mortar should be sprayed with masonriseal (or similar substitute) once a year or more often as necessary.



PHOTO 15. Pithouse - Reconstructed

Preservation Materials

The following list is a description of the various non-native items that we used in the stabilization and reconstruction of the site. Locally gathered materials were used whenever possible, however, in the interests of long term preservation, structural soundness, and expediency these other materials were utilized.

MASONRISEAL - This product is a water miscible, siloxane anti-capillary. It was soaked into the adobe to prevent erosion and protect in abrasive contact. It will be applied periodically as part of the maintenance of the structures. (see Appendix IV)

PENACHLOROPHENOL - This product is a wood preservative. It protects against shrinkage, swelling, fungi, and insects.

CEMENT BOND - This product is a cement adhesive used to improve the bonding strength of the adobe and mortar mix.

HYDROPLASTIC CEMENT - This cement is designed for frequent exposure to water and moisture. It was used on the last stone course to form a structurally sound bond and to protect against human traffic and abuse.

LIME - Plasterers' lime was used as a substitute for calcium carbonate in the mortar mix and as a stabilizer in the adobe mix.

SAND - Sharp sand purchased from a cement company was used to bind the mortar and adobe mixes.

CLAY - Clay was purchased from an adobe company at La Luz as there was insufficient time to gather locally.

STEEL REINFORCING BAR - Rebar was used in the last stone course to tie the structure together.

MATERIAL CULTURE

This excavation revealed only a small section of a long occupied and very large village. As such, the artifacts recovered represent only a sample of the total universe. Even so, it is obvious that the peoples living at Three Rivers had not only a well defined, serviceable and technologically advanced material culture, but a beautiful one as well.

CERAMICS

The local ceramics from this site include both oxidized (Brownwares and Terracottas), and reduced pottery (Chupadero Black-on-White), as well as thirteen different intrusive types.

In this section, ceramic descriptions will be given for each pottery type. Published descriptions are cited whenever possible. Where published descriptions were not adequate to cover the range of local variations, new descriptions appear in the text.

Two tables have been compiled showing the types and their distribution throughout the site. These tables divide the site into four areas: Masonry Structure, Adobe Structure, Outside Use Area, and Storage Pits. Within these four areas, further sub-divisions have been made showing the individual features. One table presents the information in terms of numbers and the other in percentages (Illustrations 14 and 15).

The local ceramics will be described first, beginning with the Terracottas. The Terracotta types in this area include San Andres

Identification Key of Pottery Types

- I Three Rivers Red-on-Terracotta
- II San Andres Red-on-Terracotta
- III Jornada Red
- IV Plain Three Rivers Red-on-Terracotta
- V Jornada Brown
- VI Chupadero
- VII Pinedale Polychrome
- VIII St. John's Polychrome
- IX St. John's Black-on-Red
- X Hesotauthla Polychrome
- XI Wingate Black-on-Red
- XII Puerco Black-on-Red
- XIII Plain White Mountain Redware
- XIV Red Mesa Black-on-White
- XV Mimbres Black-on-White
- XVI El Paso Polychrome
- XVII El Paso Bichrome
- XVIII Playas Red Textured
- XIX Reserve/Tularosa Corrugated

ILLUSTRATION 14 & 15 - Distribution of sherds - Numbers and
Percentages

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	TOTAL
3	23	2	5	2	152	68			1							6		2		261
4	1				21	6										1		1		30
7	9			4	52	19														84
12	55	1	4	12	376	130			1							7	7	10	5	609
3	25		2	10	152	58										4	1	1		253
4	47	2	6	15	331	156	2									10	3	4		576
7	38		2	13	288	128			1							5	5	1	1	483
8	25		4	10	67	33			1							6	2	4	1	156
10	45	1	3	8	295	140			1	2						7	4	9	5	520
12	37	1	5	6	202	72					1					5	3	1	5	338
13	31	1	3	6	248	102										11	6	1		409
14	20	3	4	2	173	88								1		5	4		1	301
18	13		3	8	26	12			1									1		64
22	22		3	2	149	64			1		1					4	1	1	2	260
23	8		3	2	48	20										7	4	3		95
Total	399	11	47	100	2580	1076	2		7	2	3		1	1		78	40	39	20	4439

ILLUSTRATION 14. Distribution of sherds - Numbers (continued on following page)

Masonry Structure

Floor

General

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	TOTAL
6 Floor	17	1	1	4	62	11			1						1	1	1			100
19	11		1	3	84	26			1									1	3	130
6 Adobe	212	7	34	60	1418	686		1	4			1				57	18	26	14	2538
19 General	96	3		23	815	356			1							40	15	22	3	1382
20				10	2											3				15
Sterile	7		1	2	53	19											1			83
Total	343	11	37	92	2442	1100	1	7				1			1	101	35	49	20	4248
5	13			2	61	29	1									5				125
15 Floor	1				42															43
16	8				56	5										20		30		119
5 Outside Living	27	1	4	2	222	63		1								11	6	2	1	340
15	10		3	5	59	19										1	1	2		100
16 General	26	1	2	5	256	32	9	1								9	13	5	3	362
17	30			8	227	39			1							17	11	11	2	346
Total	115	2	9	22	923	187	10	3								63	31	50	6	1455

- 61 -

ILLUSTRATION 14. (continued)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	TOTAL
Storage	2	1		9	3											4				19
U-21	43	3	5	5	266	99	1					1				6		6	5	447
C-21																				
Total	45	4	5	5	275	102	1					1				10		6	5	466
TOTAL	912	31	106	226	6220	2485	12	1	18	2	3	1	2	1	1	266	107	144	51	10,589

ILLUSTRATION 14. Distribution of sherds - Numbers (completed)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	TOTAL
3 9%	.3	.2	.2	.3	58	26		.4								2		.8		2%
4 3%					70	20										3		3		.3%
7 11				5	62	22														.8%
2 9	.2	.2	.2	2	62	21		.2					.2			1	1	1	.8	6%
3 10			.8	4	60	23										2	.4	.4		2%
4 8	.3	1	3	57	27	.3										2	.5	.7		5%
7 8		.4	3	60	27			.2		.2						1	1	.2	.2	4%
8 16	2	3	6	43	21			.6		.6						4	1	3	.6	1%
10 9	.2	.6	2	.2	27			.2	.4							1	.8	2	.7	5%
12 11	.3	1	14	53	21				.3							1	.9	.3	1	3%
13 8	.2	.7	1	61	25											3	1	.2		4%
14 5	1	1	.2	57	29								.3			2	1		.3	3%
18 20		5	13	41	19			2										.2		.6%
22 12		1	1	57	25			.4	.4							2	.3	.4	.8	2%
23 3		3	2	51	21											7	4	3		.9%
Total	3	.6	2.2	58.1	24.7	-		.2	-	.9			-	-	-	1.75	.9	.9	.45	100

ILLUSTRATION 15. Distribution of Sherds - Percentages (continued on following page)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	TOTAL
Adobe	6	.2	1	1	4	62	11	.03	1					1	1	1	1			.9%
	19	8		.8	.2	65	20		.8									.8	.2	1%
	6	8	.04	1	2	56	27		.2		.03					2	.7	1	.6	24%
	19	7	.2	.6	2	59	14		.1							3	1	.2	.2	13%
	20				67	13										20				.1%
Sterile	8		1	2	64	23										1				.8%
Total	8	-	.1	2.3	58.5	26.		-	.1		.1			.1	2.4	.8	.9	.7		100
5	10	.3		2	49	23	.8									15				1%
Outside	15	2				98														.4%
	16	7	.3		47	4										17		25		1%
	5	8		1	.6	62	19		.3							3	2	.6	.3	3%
	15	10		3	5	59	19									1	1	2		.9%
	16	7		.6	1	71	9	2	.3							2	4	1	.8	3%
General	17	9			2	66	11		.3							5	3	3	.6	3%
Total	8.7	.1	.6	1.5	64.7	13.	.7		.2							4.4	2.2	3.5	.4	100

ILLUSTRATION 15. (continued)

I II III IV V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII XIX TOTAL

21	11	55		32	16										21					.1%
21	10	.7	1	3	56	22		.2				.2			1	1	1			4%

Total	9.8	1.0	.9	.9	59.2	22.1	.2					.2			2.2	1.3	1.2			100
-------	-----	-----	----	----	------	------	----	--	--	--	--	----	--	--	-----	-----	-----	--	--	-----

TOTAL	9%	.3%	1%	2%	59%	23%	.1%	.01%	.2%	.01%	.02%	.01%	.01%	.01%	.01%	3%	1%	1%		5%
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ILLUSTRATION 15. Distribution of Sherds - Percentages (Completed)

Red-on-Terracotta, Three Rivers Red-on-Terracotta, and Three Rivers Plain Terracotta. As Three Rivers Red-on-Terracotta constitutes the largest group of the total Terracottas, it will be described first. Although Three Rivers Red-on-Terracotta has been previously described and the descriptions synthesized in the Human Systems Technical Manual (HSR 1973), it is felt that the description does not adequately cover all of the variations encountered within the Three Rivers Red-on-Terracotta sherds found during this excavation. The following, then, is Southward's description of this type as it occurs at this site:

Paste: The strength (Shepard 1956:p.130) of the paste is medium-hard to hard. Breakage of a sherd results in a clean break revealing the texture of the paste to be even and compact. The completeness of oxidation of the paste is found to vary considerably. Occasionally, a carbon streak is present, but most often the interior surfaces of sherds are terracotta while the exteriors are greyish brown. The penetration of color into the paste from either side is variable but the effect, regardless, is two-toned. At times this two-toned effect is mixed with a carbon streak to give a tri-colored paste effect. In many instances, the vessel has been completely oxidized and the paste is terracotta throughout. The terracotta of these sherds ranges from a light ochre-red to a deep true terracotta red. The Munsell Color Chart ranges are: Hue 2.5yr -7.5yr ; Value 4-7 (with the majority of the sherds falling at 5-7); and Chroma 2-8 (with the majority falling at 4-8; the samples which gave "2" readings were burned sherds).

The carbon streaks appearing were most often light grey - - rarely a dark charcoal grey. The incompletely oxidized exteriors ranged from light greyish brown to a yellowish brown.

Temper: The tempering material is predominantly a fine grained, crushed, sub-angular igneous material (colors - - bluish grey, grey, white, cream, with the cream/white predominating), occasional flecks of biotite and grains of hematite, and rarer rounded grains of quartz. In many of the sherds, a dark shiny/grainy material occurs. This material may be either augite or hornblende.

In the oxidized portions of the sherds, the hematite fires to a reddish-brown. In the reduced portions, the hematite appears brownish/black with only a tinge of red.

While the tempering particles are predominantly fine (temper size is according to Wentworth found in Shepard 1956:118) there are occasional medium to coarse inclusions of the sub-angular igneous material and the angular feldspar.

Surface Finish: The interiors of bowls are floated and polished. Temper grains do show through to the surface and the polishing marks can often be felt as well as seen. The vessels are polished after application of the paint. The overall interior appearance is one of a smooth, fine, even surface.

The exteriors of vessels are poorly finished, ranging from perfunctorily wiped but not smoothed with coils very evident, to a rough float and haphazard polish, still, however, with the coils

evident. On the exterior the clay is often very irregular with shallow indentations and bumps.

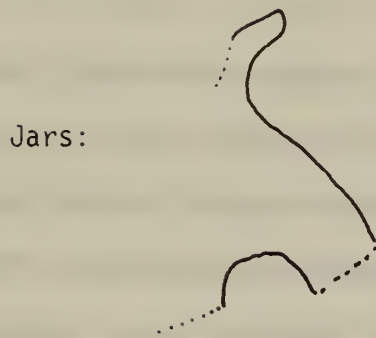
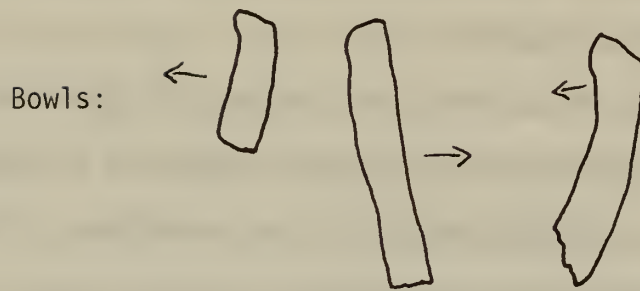
Paint: The paint is an iron oxide ranging in color from red to red/purple, to a definite purple. The paint is at times transparent and fugitive appearing, while at others very thick and opaque. Both hematite and limonite were found on the site and it is felt that either one of these or both may have been the pigment used to produce this paint.

Application: Paint application ranges considerably from sloppy lines with fuzzy edges to fine, clear, crisp lines and solids. Overall paint application tends to be consistently clear and crisp.

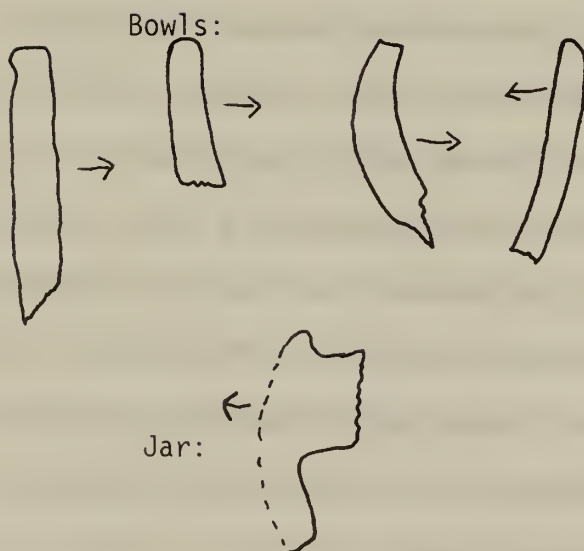
Designs: The pattern is a narrow line decoration. The lines are predominantly 1mm-3mm in width. The lines occur just below the rim and then plunge into the bowl to divide the interior field into three or four sections. Two to six lines are used in the design and often the formation of the pattern is accomplished through the use of a single continuous line. Besides the straight lines, spiral lines are used as well as solid triangles. These solid triangles are never left floating in the design but are always attached to a line giving the appearance of a flag or series of flags. The rims are always painted with the iron oxide paint.

Vessel Forms: The Three Rivers Red-on-Terracotta vessels found in this portion of the site are predominately shallow bowls with rounded bases and slightly incurved rims. The rims are flattened (Illustration 16). The jar sherds found represent less than 3% of

THREE RIVERS RED-ON-TERRACOTTA



SAN ANDRES RED-ON-TERRACOTTA



sherd collection. One good jar rim indicates that at least one jar was narrow-necked with a handle very near the rim, much as the narrow-necked jars of Chupadero. This rim is slightly everted. The rest of the jar rims are too incomplete to tell vessel shapes.

Comments on Three Rivers Red-on-Terracotta: In examining the Three Rivers Red-on-Terracotta sherds, it was noticed that most of the exteriors of the sherds are fireclouded, while the interiors are noticeably not fireclouded. Conversely, the interiors of the sherds are terracotta while the exteriors are usually the poorly oxidized greyish tan mentioned above. It is felt by Southward that the objective of the firing process of these Three Rivers Red-on-Terracotta bowls was to obtain a good terracotta color at least on the inside of the bowl with perhaps lesser hopes of achieving the same good color on the exterior of the bowls. Since the fireclouds and lack of terracotta appear so frequently on the exteriors it is felt that the bowls were fired upside down with the fuel very close to the vessels. The prevalent fireclouds and unoxidized exterior may be inherent in the firing process needed to achieve the goal of a good terracotta on the interiors of bowls.

It is necessary to note here the difficulty that was encountered in separating Three Rivers Red-on-Terracotta from San Andres Red-on-Terracotta. Since there were only a few restorable vessels, the fragmentary nature of the sherd collection increased this difficulty. Research on pottery types before excavation (Human Systems Technical Manual 1973 and Jane Kelley 1966) suggested the possibility of finding both types present at this site.

After excavation had begun , a field separation of the two types was undertaken. The published descriptions (Human Systems Technical Manual 1973) were found to be of little help in dealing with the ceramics at this site as only slight differences were found in temper or surface treatment between the types. The field separation was based on thickness of line, sloppy application of paint, and presence or absence of "good" terracotta color.

By the end of the excavation period it was apparent that if both San Andres Red-on-Terracotta and Three Rivers Red-on-Terracotta appeared together at this site our methods of separation had not shown which was which. Thick lines were often much less sloppy than thinner ones.

Next, it was felt that perhaps measuring minimum and maximum line widths on the sherds and plotting the data would reveal a bi-modal distribution separating the two types. A partial sample of forty sherds from each of our "types" was plotted. A continuous line for both minimum and maximum measurements resulted with no modes occurring. The test was repeated with a different sample of forty sherds. To allow for the possibility of too small a sample, 72% of the entire sherd collection was tested. Again, the result for both minimum and maximum measurements was a continuous line (Illustration 20).

After all these tests, it was felt that the population of Terracotta at this site was indeed predominantly Three Rivers Red-on-Terracotta. The desire, however, not to mistakenly lump

	Minimum Width Whole Sample	Maximum Width Whole Sample	Minimum Width Partial Sample	Maximum Width Partial Sample
WIDTH				
1 mm	396	324	29	26
2	168	199	14	12
3	47	48	14	11
4	20	39	5	6
5	9	19	3	9
6	5	11	3	3
7	8	11	1	4
8	2	3	1	4
9	3	2	3	1
10	1	1	0	2
11	2	3	2	1
12	1	1	0	1
13	0	0	1	0
14	0	0	0	0
15	1	1	0	1
16	0	0	0	0
17	0	0	0	0
18	0	1	0	1

ILLUSTRATION 20. Terracotta Line Modes

the two types, if there were indeed two types, was still present, but the method of separation was not apparent. After much individual inspection, 36 sherds out of 912 were separated as being San Andres Red-on-Terracotta.

The following, then, is a description of this type. The reader is cautioned to remember the great variability within the Terracotta types in terms of width of line, application of paint, and prevalence of terracotta color. Southward feels that this description should be the object of further analysis.

The San Andres Red-on-Terracotta represents 3.95% of the total decorated Terracotta Wares. The following description will be partly that found in Human Systems Technical Manual (HSR 1973) and partly Southward's observations. It will be noted which are from the Human Systems Manual.

Paste: The strength (Shepard 1956:130) of the paste ranges from friable to medium hard. A fresh break usually reveals a fairly compact paste. The oxidized portions of the paste range from a dark reddish brown to a light dusky red or salmon terracotta, to a yellowish tan or dark greyish brown. The Munsel Soil Chart ranges are: Hue 2.5yr , Value 4-5 (with the majority of sherds falling at Value 5) and Chroma 2-8 (with most sherds falling between 4-8); and Hue 5yr , Value 4-6 (with the majority of sherds falling at Value 6) and Chroma 2-6 (with most sherds falling between 4-6). Those sherds falling at either a low Value or Chroma are those that only partially oxidized. While many of

these partially oxidized sherds had almost entirely brownish/black or black cores, the surfaces always oxidized at least to a dusky light tan or light terracotta.

The visible appearance of the paste can only be described as highly inconsistent. Of the 36 sherds inspected only 3 had no carbon streak and were completely oxidized. The carbon streaks range from a light grey, to dark grey, to a brownish/black. The interiors of bowls and exteriors of jars usually come closest to being terracotta. The exteriors of bowls and interiors of jars rarely are oxidized. Within the oxidized portions of the paste the amount of oxidation is varied so the color often appears either variegated or gradated. The penetration of oxidized color into the paste varies not only between sherds but within individual sherds.

Fireclouds are common as was the case with Three Rivers Red-on-Terracotta. As opposed to the Three Rivers type, fireclouds appear on the interiors of bowls much more frequently.

Temper: The temper is similar to that of Three Rivers Red-on-Terracotta (see above) with crushed particles of a sub-angular igneous material and angular feldspar (colors - - white, greyish/blue, cream and pink). Also similar to Three Rivers Red-on-Terracotta, occasional particles of biotite, hematite and a dark unknown shiny/grainy material occur. Rarely do grains of quartz appear. The temper size ranges from fine to very coarse (Wentworth - - in Shepard 1956). There is still a predominance of fine to medium

particles. Coarse to very coarse particles are more frequent than in Three Rivers Red-on-Terracotta. There is an inconsistency in temper size within individual San Andres sherds as opposed to those of the Three Rivers type.

Surface Finish: Like Three Rivers Red-on-Terracotta the interiors of bowls and exteriors of jars are smoothed and floated in many cases, though bumps and shallow indentations that have not been smoothed out are very evident. The sherds are predominantly polished after application of the paint. However, there is one sherd that was polished before the paint was applied. On several of the sherds the painted portions appear much more heavily polished than the unpainted portions. The polishing marks are very noticeable.

The exteriors of bowls range from not smoothed and wiped with rough brush marks and coils evident, to perfunctorily smoothed and wiped, and finally to a rough float and polish. In all cases the wiping marks are very evident. The interiors of jars are left very rough.

Paint: The paint is an iron pigment which is dark reddish-brown. The paint is permanent but at times is so thin that it appears to be fugitive (Human Systems Technical Manual 1973). Besides the deep reddish-brown, some of the sherds in this sample have a purple tinge noticeable in the paint.

Designs: Single and multiple crude wide lines are most common. Lines appear in singles or in parallel groups, or are crossed to produce squares, triangles, or diamonds. The rims

are painted. A single broad line is often present encircling the vessel on the interior just below the rim (Human Systems Technical Manual 1973). In the sample found at Three Rivers, crude wide lines ran parallel to the rim, perpendicular to the rim or radiated from the rim. Those lines radiating from the rim were found in pairs forming an inverted V.

No single broad line was found encircling the vessel on the interior of the rim that was not incorporated into a design. One sherd has a spiral line design accompanied by dots. This was undoubtedly an attempt to try something new. This style is common on Chupadero sherds at the site, but the design styles of San Andres and Three Rivers Red-on-Terracotta rarely have floating elements. All elements are attached in an overall design.

These San Andres sherds are too fragmentary to determine whether or not the line designs are continuous like those of Three Rivers Red-on-Terracotta.

The paint application on these San Andres sherds is very haphazard. The lines are often wavy with fuzzy edges. The paint is thick in some places and thin in others. Marks, perhaps from a fiber brush, are very apparent in the thicker, wider lines. Compared to Three Rivers Red-on-Terracotta, application is not as neat and precise and design placement is not as controlled.

The lines on these San Andres sherds range from just slightly above 3mm to at least 30mm (one line measures 30mm but is fragmentary leaving the exact width unknown).

Vessel Form: These San Andres sherds are predominantly bowls. There do seem to be more jar sherds present comparatively than there was in the Three Rivers Red-on-Terracotta sherds. These sherds are too fragmentary to tell overall vessel shape. Most rims are direct. Some bowl rims curve in slightly. On most sherds some attempt at flattening the rim was made (Illustration 16).

Comments on San Andres Red-on-Terracotta: The San Andres sherds in this collection appear very similar to the later Three Rivers Red-on-Terracotta sherds. The paint application was found to be much cruder, with the paint being uneven, the lines sloppy, and the edges fuzzy. Generally, the lines were wider than those found on the Three Rivers sherds, but this should not be taken as sole indication of a San Andres sherd. The design elements seem ancestral to the later Three Rivers style, but the treatment is much bolder and looser. The greatest difference between the San Andres sherds and the Three Rivers Red-on-Terracotta sherds is one of consistency along a continuum. The same attributes appear in both types. The attributes are not only consistent but predictable in the Three Rivers sherds. Overall, the San Andres sherds appear much less refined than the Three Rivers Red-on-Terracotta sherds.

The next local oxidized types are the Brownwares. The plain brown sherds represent the largest number in the excavation. Since the Brownware population was so large, a sample of it was selected for description. The following is the description:

Paste: The strength of the Brownware paste ranges from very friable to slightly compact. A fresh break on the sherd usually

crumbles, showing the paste to be uneven and inconsistent.

The color of the paste ranges from light tan, brown, or red to a deep reddish brown, to a chocolate brown. The Munsell Color Chart ranges for these colors are Hue 2.5yr - 7.5yr, Value 3-5 and Chroma 2-8.

Black carbon streaks are very common as well as a tendency for incomplete oxidation of the paste.

The paste is usually two-toned with one-half of the paste being less oxidized than the other. In a few instances, a large dark grey core bordered on each side by two thin strips of oxidized paste was found. After analysis of temper type and surface treatment these sherds were found to be Type B of the Body sherds of El Paso polychrome.

Temper: An analysis of the sherds revealed two temper types. These were designated Type A and Type B.

Type A: This temper type is predominantly crushed, sub-angular igneous material (color - - grey, white and pink) and crushed angular feldspar (colors - - grey, white and pink). There are occasional inclusions of biotite and hematite. There was also a shiny/grainy material, possibly augite or hornblende. These particles range from fine to medium. Coarse and very coarse (Wentworth, in Shepard 1956) inclusions did occur, however, in the angular and sub-angular igneous materials. In these very coarse inclusions, it was possible to see under the microscope still smaller particles within the temper itself.

As was the case with the Terracotta types, in the fully

oxidized portions of the sherds, the hematite appeared a reddish/brown color, while in the incompletely oxidized portions the hematite remained blackish/brown.

Type B: In this type, the temper is crushed sub-angular igneous particles with less angular feldspar (colors - - white and cream, occasionally grey) and sub-angular or rounded quartz grains. Occasionally, flecks of biotite appear. Hematite is absent as is the black shiny/grainy unknown material mentioned in Type A. As opposed to Type A, the tempering particles are predominantly coarse and very coarse with occasional particles of fine and medium size.

Surface Finish: The surface finish will be described according to the categories of the temper types mentioned above.

Type A: Both the exteriors and interiors of the sherds have been smoothed and polished. Rarely does the temper protrude and the surface is usually even to the touch. Individual polishing marks are usually evident. It should be noted however, that finishing of the sherds is in varying degrees from perfunctory to glossy.

Type B: Both the interiors and exteriors of these sherds have been soft-wiped and slightly polished. The striations resulting from wiping are very evident and the raised portions of the striations are the glossiest part of the sherd. Striations and shallow indentations, not smoothed from the clay, are readily felt along the surface. The temper particles protrude through to the surface.

Vessel Shape: Jars are far more common, with only 7% of the plain brownware being bowls. There were not enough whole vessels or large sherds to determine the heights of the jars or their bottom shape, but the rims are wide mouthed with predominantly flaring, everted rims and high shoulders (Illustration 17).

Comments on Brownwares: It is felt that the Brownware represented by the Type A descriptions is Jornada Brown as described by J.D. Jennings (1940) and later renamed by H.P. Mera (1943). The Brownware represented by Type B is believed to be unpainted portions of El Paso Polychrome as described by Human Systems Technical Manual 1973. At first it was felt that these sherds (representing 9% in the Plain Brownware Sherds selected for the sample) might have been El Paso Brown as described by Lehmer (1948:94), but of the 116 Plain Brownware rims collected from the excavation, none of the rims appeared to be El Paso Brown. All of the rims inspected had Type A temper and surface finish. Those few rims that were not everted but direct as would be expected in El Paso Brown (Lehmer 1948:94 and personal experience Southward, UTEP survey under direction of Dr. Rex Gerald) were felt to be Jornada Brown on the basis that they possessed Type A temper and surface finish.

The next local type is a red-slipped brownware that has not been named. It will be here named Jornada Red. This type has been previously mentioned as both a redslipped or washed brownware (Human Systems Technical Manual 1973; Kelley 1966; Wimberly

BROWNWARE RIM - JARS

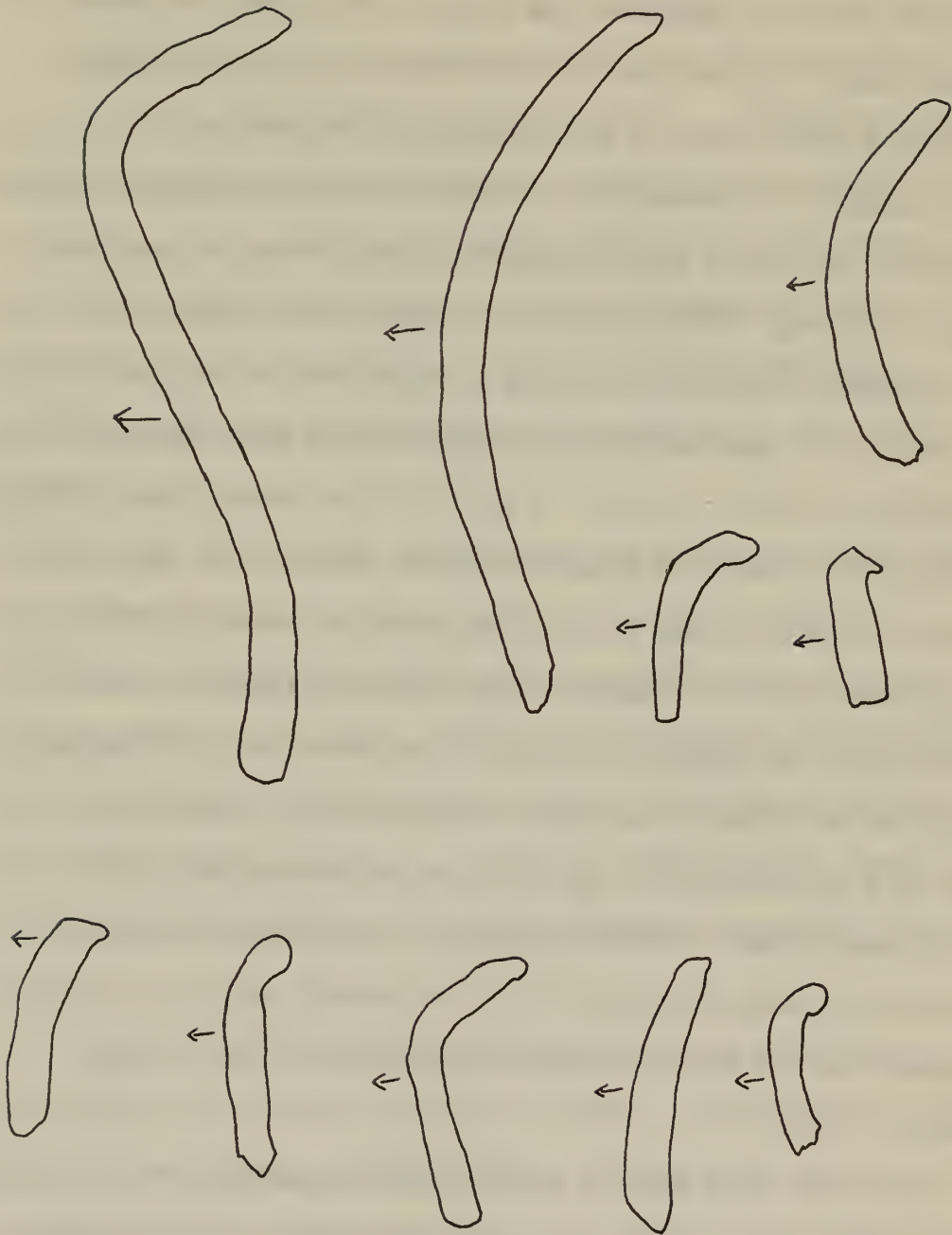


ILLUSTRATION 17

(These Rims are actual size)

BROWNWARES: BOWLS

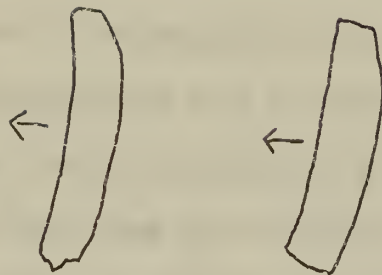


ILLUSTRATION 17 (Con't)

and Rogers Mss.; and Jelinek 1967) and a redslipped redware (Wimberly and Rogers Mss.).

Paste: The strength of the paste is friable to medium-hard. A fresh break usually reveals a fairly consistent and compact paste. The color of the paste ranges from light tan and brown, to a chocolate brown, and from a light yellowish red (terracotta), to a deep reddish-brown. The Munsell Color Chart ranges for these colors are: Hue 2.5yr - 7.5yr, Value 2-7, and Chroma 1-8. Those sherds with Values of 2-3 and Chromas of 1-3 were not oxidized.

The visual appearance of the paste varies, much like both the Brownwares and Terracottas in the area, due to incompleteness of oxidation. Many of the sherds do completely oxidize. However, the typical result is the two-toned effect mentioned earlier, in which one half of the sherd will oxidize and the other half will not. Penetration of oxidized color into the paste varies considerably. Carbon streaks are very common and range from a light grey to a dark charcoal grey, to brownish/black and black.

Temper: The temper material is identical to other local wares in the area, being predominantly a crushed, sub-angular igneous material (colors - - grey, white and pink) and crushed angular feldspar (color - - grey, white and pink). There are also occasional crushed inclusions of biotite, hematite and a shiny/grainy material (possibly augite or hornblende). In the fully oxidized portions of the sherds, the hematite appears reddish/brown, while in the unoxidized portions it appears blackish/brown.

The tempering particles are predominantly fine to medium in size (Wentworth, in Shepard 1956), however, coarse and very coarse inclusions, particularly of the sub-angular and angular igneous materials are common.

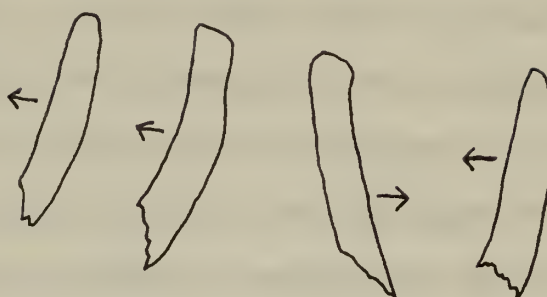
Surface Finish: The exteriors and interiors of bowls and exteriors of jars are usually smoothed and polished. The polishing is done after application of the red slip. The interiors of jars are usually left rough, with scraping marks very evident. Occasionally the temper grains will protrude through to the surface. It should be noted that the surface finishing is inconsistent, ranging from only prefactorily smoothed to glossy. Both smoothing and polishing striations are evident.

Slip: The slip is an iron oxide that ranges from dusky red to deep reddish brown. Occasionally the slip has a tinge of purple. The slip varies between very thin and transparent, to thick and opaque. The slip is not fugitive even though it appears so on those sherds where it is thin and transparent. Although the sherds are very small and fragmentary the slip appears to be applied over the entire interior of bowls and exterior of jars including the tops of rims. Only in two bowl sherds does the red slip extend below the rim on the exterior and this is not more than an inch.

Vessel Form: In this collection of sherds the predominant forms are bowls, but jars are not uncommon. As mentioned above, the sherds are very fragmentary so overall shape remains undetermined. Bowl rims are either direct or only slightly incurved (Illustration 18). The rim tops are occasionally flattened. The jar necks are very short and the rims are everted.

JORNADA RED RIMS

Bowls:



Jar:



ILLUSTRATION 18

Comments on Jornada Red: It is interesting to note that this local type combines the attributes of two other local wares in the area - the Brownwares and Terracottas. The surface treatment is the same as the Brownwares; the slip appears the same as the paint used on San Andres Red-on-Terracotta and Three Rivers Red-on-Terracotta. The paste color of Jornada Red ranges much like the Jornada Brown in this area, from a deep chocolate brown to a light terracotta red.

Comments on Local Wares: It was noticed during examination of the Brownwares and Terracottas that many of the sherds, regardless of type had a light brownish - reddish Terracotta color. Fifty sherds were selected at random from each type and the color of the paste checked accordingly to the Munsell Standard Soil Color Charts. Hue, Value and Chroma were plotted for each type separately and then the totals for each type plotted on the same graph (Illustration 21). There is considerable overlap between the samples of the two types. The Terracottas and Brownwares are felt by Southward to be locally made due to their abundance in the total sherd collection and the similarity of temper. While a clay analysis is far beyond the scope and funding of this project, a suggestion that the same or similar clay bodies were used for the two differing types is not. The comparison of colors of paste is by no means intended as proof of this postulate, but rather as an interesting consideration for future work.

A large number of Chupadero Black-on-White sherds were found on this site, making Chupadero the second most abundant (23.4% of

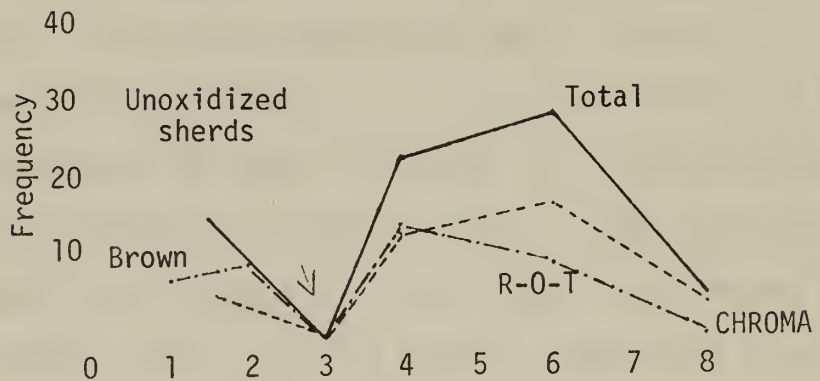
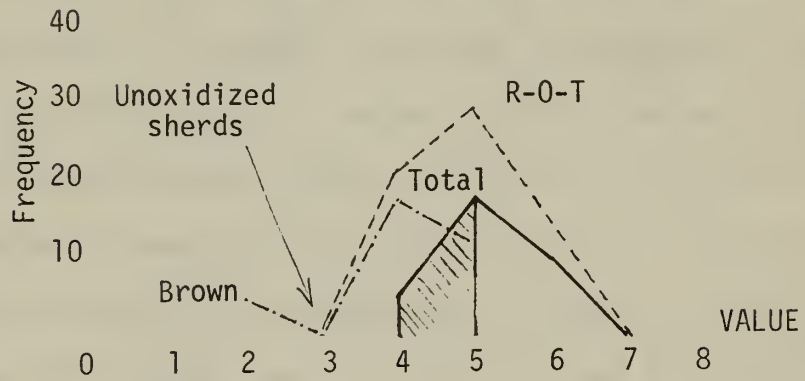
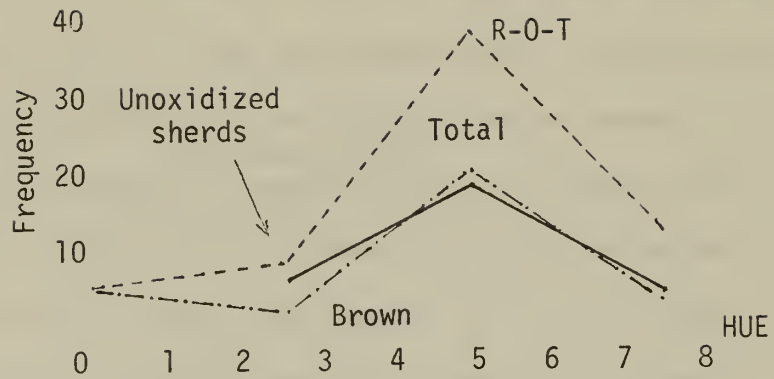


ILLUSTRATION 21. Munsel Color Comparison of Three Rivers Red-on-Terracotta and Brownware Pastes.

the total) type found on the site. For the purposes of this report, the Chupadero description found in the Human Systems Technical Manual (HSR 1973) will be used. Two comments on this description will be added. The first of these deals with sub-glazing. During the excavation it was noticed that a large portion of the paint on the Chupadero sherds was glazed. An examination of 1,294 painted Chupadero sherds revealed that 31.4% were sub-glazed. Second, several of the rim sherds examined still had handles attached. These handles were made from rolls of clay fused together and attached at the rim either vertically or horizontally. The handles were attached in most cases by poking a hole through the vessel wall before firing and inserting the end of the handle. The holes made through the vessel wall were often not smoothed over. In one case where the handle was placed horizontally along the rim there appears to be no hole through the vessel wall, but rather the handle was simply attached to the outside and smoothed over. For an example of Chupadero rim forms see Illustration 19.

We are not sure now whether Chupadero Black-on-White should be considered an intrusive or a local type. Southward has not been able to demonstrate that Chupadero was made locally. Nonetheless, the high proportion of Chupadero Black-on-White in the ceramic assemblage suggests that if it was not made locally it was a valuable enough commodity within the community to be a major form of trade. There were thirteen different types of intrusives represented within the ceramics excavated at Three Rivers, New Mexico.

CHUPADERO RIMS

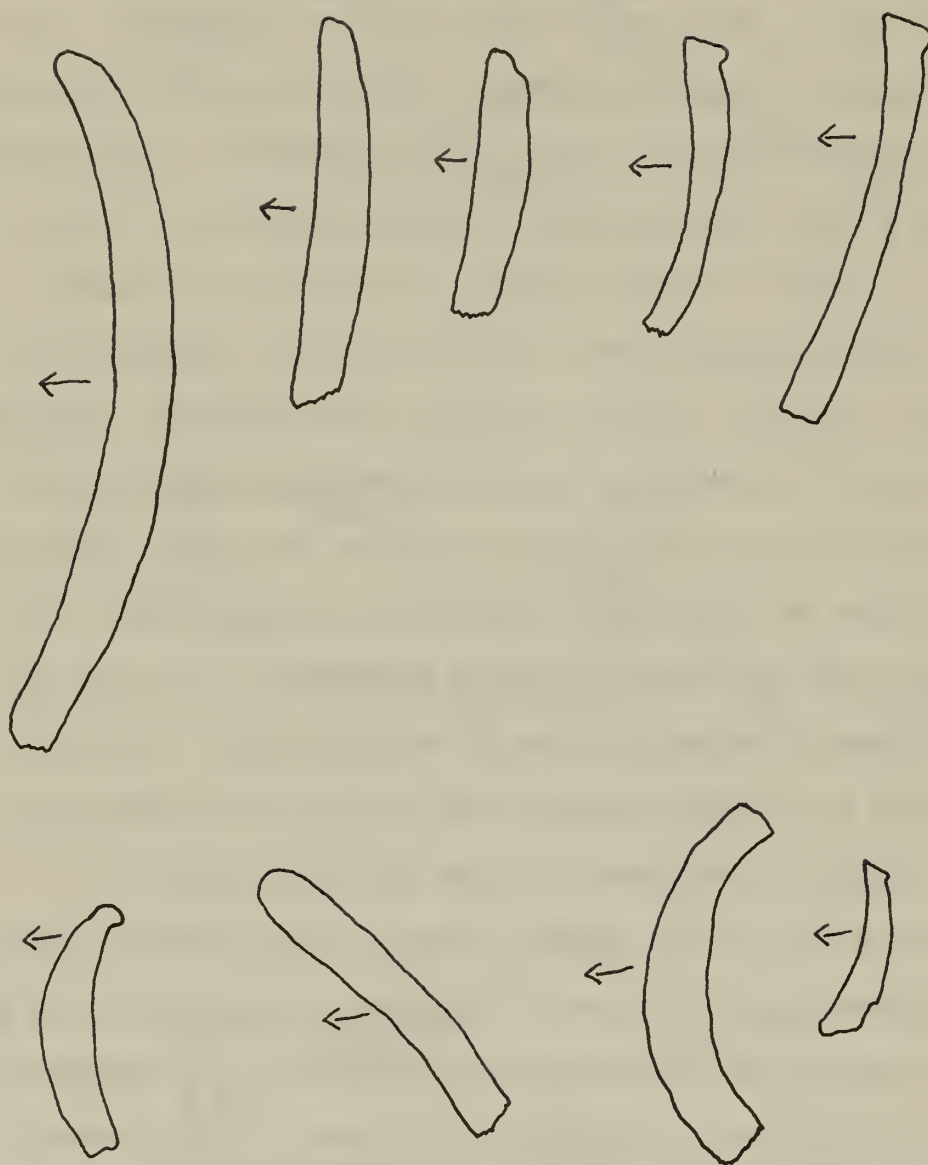


ILLUSTRATION 19

The following will be a brief summary of these intrusive types. Where it was necessary to describe a certain type or make comments, this has been done, otherwise published descriptions are cited.

The first type to be described is an unknown White Mountain Redware represented by fourteen sherds.

Paste: Hard grey with no carbon streak. Paste appears to be relatively even and compact.

Temper: White and grey angular fragments that appear to be crushed sherds. Occasionally there is a dark black angular fragment which is also undoubtedly crushed potsherd. The temper is opaque and will crush when removed from the paste. The temper size ranges from medium to very coarse (Wentworth - in Shepard 1956:118).

Paint: There is a soft brownish/black to black paint which on some of the sherds appears to have penetrated into the slip, leaving an organic stain. On other sherds, individual paint lines show traces of a thicker matte paint or crackly uneven glaze. There is also a white paint applied which is presumably kaolin.

Application of Paint: All the sherds are bowls and all have a black on red interior. Ten sherds have a black and white on red exterior. On three sherds, the white paint has presumably worn off. One sherd has split at the core leaving no exterior. The black appears to be applied after the white.

Surface Finish: The interiors and exteriors have been scraped and smoothed. The surfaces have a light red/orange to orange brown slip that varies in thickness. Polishing in most cases is done after the application of the black paint. The white paint

does not appear polished. Polishing streaks are evident and appear haphazard. Five sherds have a high polished luster while the rest vary in dullness and appear chalky.

Design: On those sherds large enough to see the field of decoration there is a Tularosa design style of hatched units interlocked with solid units of the same form and width (Carlson 1970:91, fig.46). The exterior design is made up of solid interlocked stepped triangles similar to those in front except outlined in white. Some of these triangles are also stepped. On both the interior and exterior there is one encircling narrow rim band which is incorporated into the design while at the same time serving as a border for the design.

Vessel Forms: Bowls. The rims are beveled toward the inside.

Comments: This type of White Mountain Redware is probably Pinedale Polychrome as described by Carlson (1970).



PHOTO 16. Pinedale Polychrome Sherds

The rest of the intrusives are as follows:

St. John's Polychrome -- Carlson (1970).

St. John's Black-on-Red -- Carlson (1970).

Hesothauthla Polychrome -- Carlson (1970).

Wingate Black-on-Red -- Carlson (1970).

Puerco Black-on-Red -- Carlson (1970).

Plain White Mountain Redware -- These sherds are undoubtedly the unpainted portions of either St. John's Polychrome or St. John's Black-on-Red, so the descriptions for either can be used -- Carlson (1970).

Red Mesa Black-on-White -- Gladwin (1945).

Mimbres Black-on-White -- Human Systems Technical Manual (1973).

El Paso Polychrome -- Human Systems Technical Manual (1973).

El Paso Bichrome (Black-on-Brown) -- It has not yet been established whether this is really a variation on a type or part of an El Paso Polychrome vessel with the red paint worn off. Until further work is done, the description provided in the Human Systems Technical Manual (1973) for El Paso Polychrome will suffice.

Playas Red and Playas Red Textured -- As this type occurs at Three Rivers, it is most often red-slipped and the surface has been textured in a variety of ways from incised to punched. A good description is found in the Human Systems Technical Manual (1973).

Reserve/Tularosa Corrugated -- These types occurred most often with corrugated exteriors, smudged interiors and fillet rims.

Rinaldo and Bluhm (1956) give good descriptions of these types

All the sherds identified that have been dated 1966 and Carlson 1970) fall in the late 1100's (1175) A.D. to early 1300's (1325) A.D. It is felt that this portion of the site at Three Rivers dates approximately A.D. 1200 - A.D. 1300. The following chart (Illustration 22) gives the dates that are known for the types found on this site.

Restorable Vessels: Several restorable and partially restorable vessels were found during this excavation. The following is a list of these vessels:

1. Three (3) Three Rivers Red-on-Terracotta Bowls (one of these is illustrated -- see PHOTO 17.).

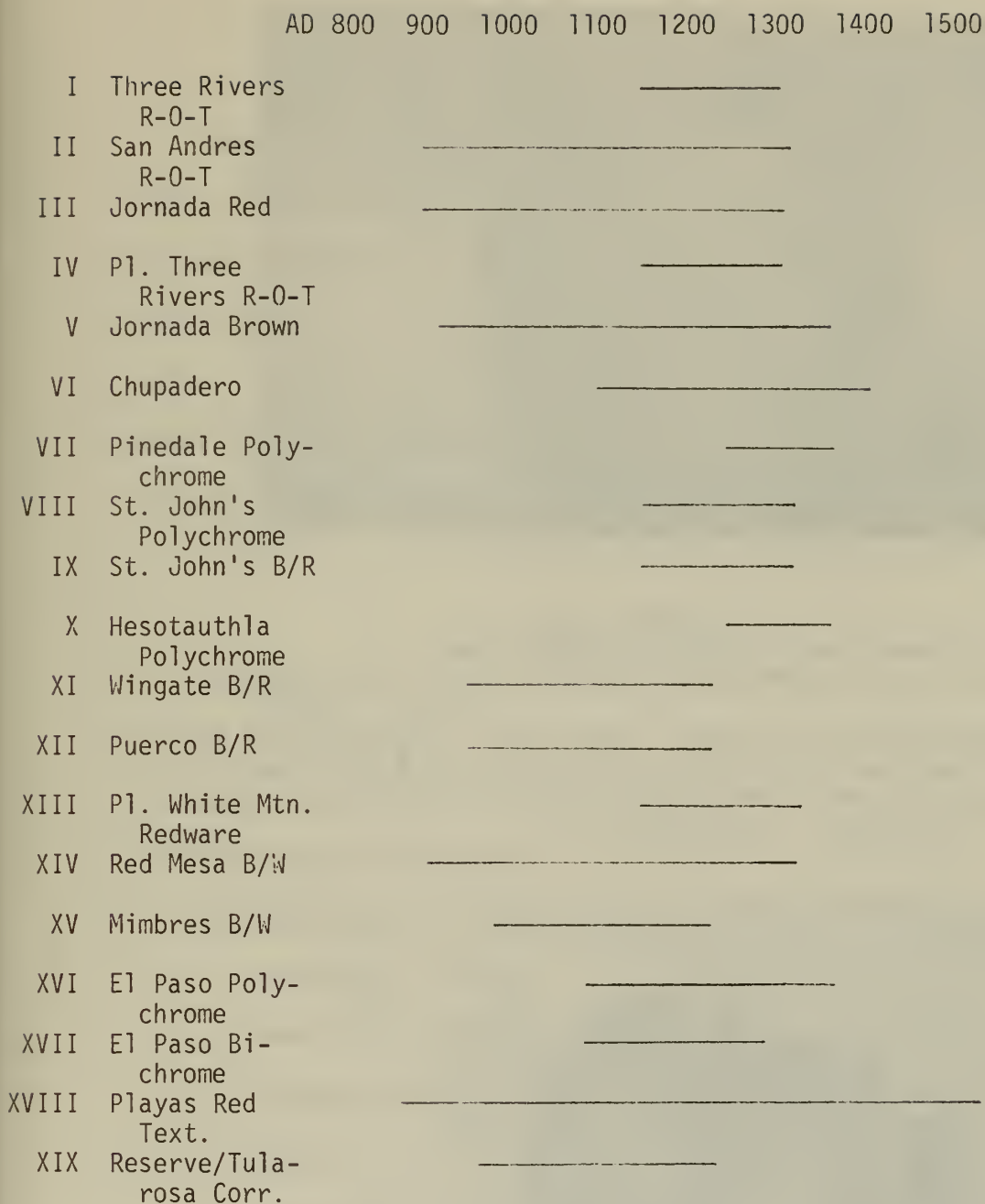


ILLUSTRATION 22. Time Sequences



PHOTO 17. Three Rivers Red-on-Terracotta Bowl

2. Four Chupadero Jars (a portion of one of these jars is illustrated -- see PHOTO 18.).



PHOTO 18. Chupadero Black-on-White jar portion

3. Two El Paso Polychrome Jars.

4. Five Brownware Vessels -- three of these are clearly jars.

Comments on Comparison of Ceramics: As can be seen from the charts (Illustrations 14 and 15), the ceramics are fairly evenly distributed throughout the site. There are no unusually large concentrations of any one of the local types in any of the three living areas (Masonry Structure, Adobe Structure, or Outside Living Surface). There is also a good representation of all the intrusive ceramics in each of the three areas.

Worked Sherds

Thirty-eight pieces of shaped and/or ground sherds were recovered from this site. The shapes, amount of grinding and pottery types used differ. The following table shows the shapes found and the pottery types used.

Rectangular with rounded corners

(essentially whole)

1 - Heshotauthla Bowl

1 - Chupadero Bowl

1 - Chupadero Jar

1 - Plain Three Rivers Red-on-Terracotta Bowl

1 - Brownware Bowl

Rounded Rectangular Corners

(broken - shape could not be determined)

- 1 - Chupadero-Jar
- 4 - Brownware-Bowls
- 1 - Jornada Red-Bowl

Rounded

(all whole)

- 1 - Jornada Red-Bowl
- 1 - El Paso Polychrome-Jar
- 1 - Plain Three Rivers-Bowl
- 1 - Brownware-Bowl
- 1 - Chupadero-Bowl - (Illustration 23)
- 1 - Brownware-Undetermined
- 1 - San Andres Red-on-Terracotta - Bowl

Rounded Edges

(broken -- shape could not be determined)

- 1 - Playas Red Textured - Jar
- 5 - Brownware - Jars
- 2 - Chupadero - Bowls
- 1 - Chupadero - Jar
- 2 - Three Rivers Red-on-Terracotta - Bowls
- 1 - Brownware - Bowl
- 1 - Brownware - Undetermined

Shape Undetermined

(drilled, but not otherwise modified)

- 1 - Three Rivers Red-on-erracotta - Bowl
- 1 - Plain Three Rivers - Bowl

WORKED SHERDS

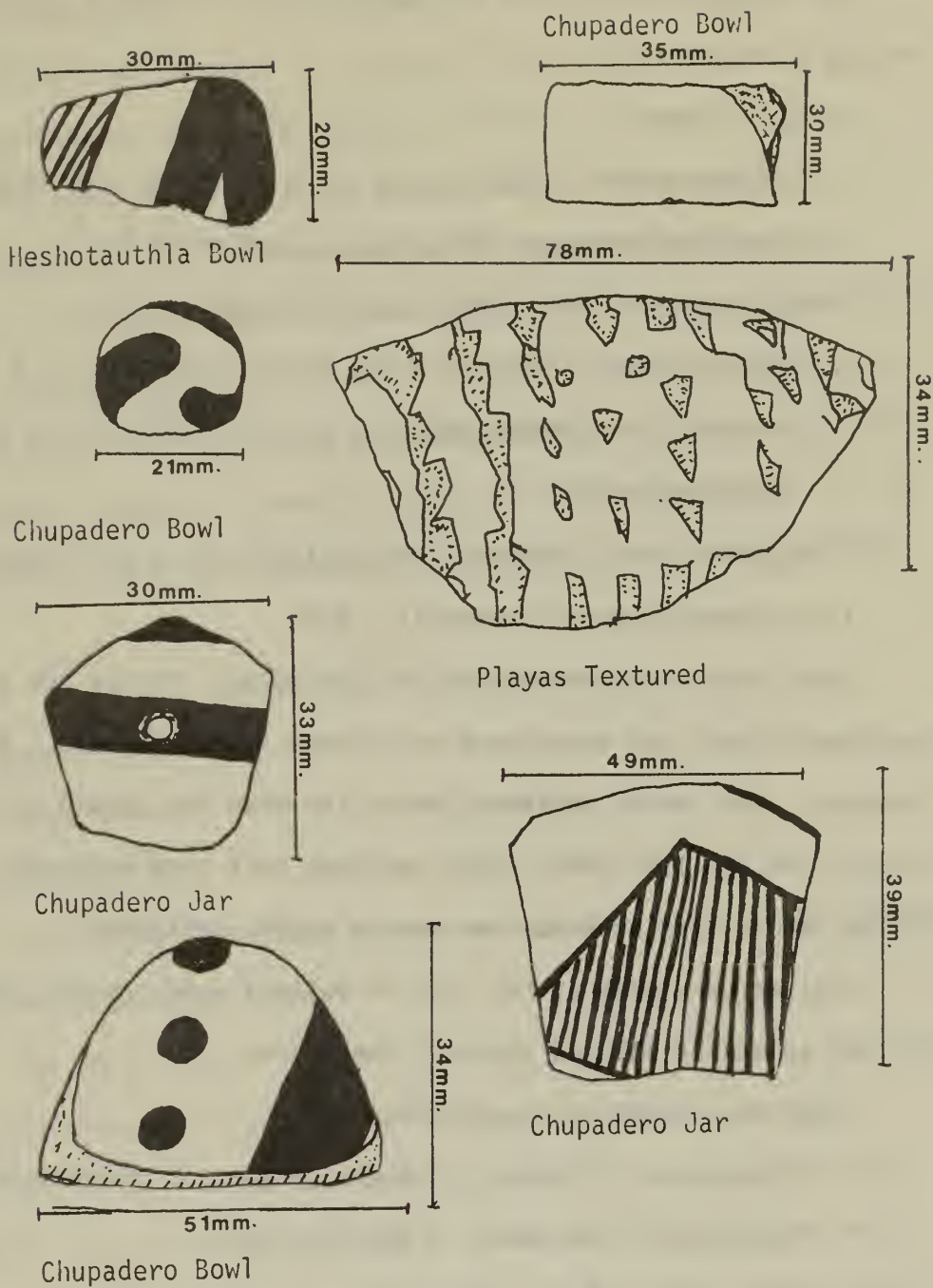


ILLUSTRATION 23. Worked Sherds

One Chupadero Jar sherd was ground as if it were a scraper forming a bevelled edge.

Unusual Shapes

1 - Chupadero-Jar (has hole drilled in middle and roughly fashioned pentagon shape - see Illustration 24).

1 Chupadero-Jar (six sided -see Illustration 24).

1 Chupadero-Jar - (This sherd has extensively used as a scraper. The ground edge has been incised with 26 lines. Illustration 24).

1 Chupadero-Jar (originally five sided but is now broken)

1 San Andres Red-on-Terracotta - Bowl

There were five sherds with drilled holes. Beside the three mentioned above, two were found and placed in the Rounded - Broken category. The breaks on these sherds are down the middle and intersect the drilled holes. This breakage must have happened during manufacture as these two sherds appear unfinished.

Tallies were made of the type of pottery used, vessel shape and the amount of painted sherds. These are:

Types and number of sherds used

Brownwares - 13 total, 6 bowls; 5 jars; 2 undetermined

Chupadero - 12 total, 6 bowls; 6 jars;

Three Rivers Red-on-Terracotta - 3 total, 3 bowls

Plain Three Rivers - 3 total, 3 bowls

Redslipped Brownware - 2 total, 2 bowls

El Paso Polychrome - 1 total, 1 jar

Heshotauthla - 1 total, 1 bowl

Playas Red Textured - 1 total, 1 jar

San Andres Red-on-Terracotta - 2 total, 2 bowls

The table shows that the types used, with one exception, are consistent with the proportions of these particular types found in the total ceramic assemblage at Three Rivers (Illustration 22). The exception is the higher proportion of Chupadero. This may be due to the fact that these people found Chupadero pleasing, or perhaps Chupadero produced a better finished product. Of the 38 worked sherds the Chupadero are the best ground and finished.

Presence or Absence of Paint

Bowls	Jars
13 painted bowls	7 painted jars
10 unpainted bowls	6 unpainted jars

This table shows that painted sherds were not greatly preferred over the unpainted sherds.

The exact use of the worked sherds remains unknown. The un-drilled sherds were perhaps used as gaming discs or counters (Barnett 1973). Those sherds with drilled holes may have been jewelry pieces for necklaces. It seems doubtful that they were used for spindle whorls as the drilled hole as well as the over-all sherd size is so small. The Chupadero Bowl sherd that has been so heavily ground and incised on one edge assuredly had some specific use but this remains unknown. It should be noted here that a similar object - a broken sandstone pendant, with a drilled

hole at the top, and ground and incised on the remaining edge, was found in the Hueco Bolson (Southward - Personal Experience, UTEP survey under direction of Dr. Rex Gerald 1976).

Other Sherds

Two sherds -- one a Chupadero painted bowl and one San Andres Red-on-Terracotta Bowl -- were found at the bottom of a posthole. The reason for these sherds being there remains unknown.

GROUND STONE

There were 100 pieces of ground stone examined from this excavation. Most of these pieces are either manos or metates, but many remain unidentifiable.

Manos-- There are 40 ground stone pieces identified as manos. Eleven whole manos were recovered. Of these 11, ten are bifacially worked, while only one is unifacially worked. These whole manos are predominantly loaf-shaped, rectangular, 2-hand manos that have been ground on at least two sides, and usually three to four. Only a few of these whole manos are round (plan view) one-hand manos. One wedge-shaped mano was recorded as well as two triangular-shaped manos. One of these whole manos measures $17\frac{1}{2}$ inches in length.

Twenty-nine mano fragments were recorded. Twenty-one of these are bifacially ground, while eight are unifacially ground. Again there is a predominance of 2 hand rectangular-shaped mano fragments as opposed to one-hand round or wedge-shaped.

Two of the manos were found with pecked surfaces. This pecking was probably an attempt to resharpen the stone.

Eight of the mano pieces were found either in floor fill or at floor contact. Four of these are whole manos -- three being two hand rectangular manos and one a 2-4 hand triangular mano. The remaining 4 manos are fragmentary. Thirty-one mano pieces were found in General Fill. One mano fragment was found near the burial in the adobe structure at the sterile level.

Metates -- Twenty-one of the ground stone pieces were recorded as metates. Six pieces are whole metates. Of these six metates, four are bifacially ground and two are unifacially ground. Most of the metates are basin-shaped. The remaining fifteen metate stones are fragmentary. Seven are bifacially ground and eight are unifacially ground.

Three of the metates show evidences of being pecked. Again, this may be to re-sharpen the stone.

Nine metates were found in the floor fill or at floor contact. These nine include four whole metates and five different fragmentary metates.

There were thirty-three pieces of unidentified ground stone recovered from this site. Nineteen pieces were found in General Fill and fourteen pieces recovered from Floor Fill or Floor Contact.

All the ground stone pieces recovered are in various stages of use and wear as would be expected of a tool of this nature.

There were four different material types used. Igneous rocks were most frequently recorded(52% of the total). Syenite was the only readily identifiable igneous material and this made up only 5% of the total. Sandstone was the second largest material type representing 35% of the ground stone pieces. One piece each of vesicular basalt and quartzite were recorded. These each only represented 1% of the total. It is not surprising that the largest group of ground stone should be igneous as the Sierra

Blancas that surround Three Rivers are igneous in origin.

A large number of the ground stone pieces (31 out of 100 pieces) were burned. This may be due to the fact that the structures themselves burned or perhaps these particular ground stone pieces were re-used as hearth stones.

FLAKED STONE

Projectile Points and Drills

Over 125 projectile points and drills (including fragments) were recovered from this site. To give an idea of the types of projectile points found, a representative sample was chosen and photographed. The projectile points are divided into the three separate living areas in these photos (Photos 19, 20 and 21).



PHOTO 19. Projectile Points -- Area A - Masonry Structure



PHOTO 20. Projectile Points - Area B - Adobe Structure



PHOTO 21. Projectile Points - Area C - Outside Use Area

The drills recovered have also been photographed; however, they have not been divided into the separate living areas (Photo 22).



PHOTO 22. Drills

Other Flaked Tools

A large number of other flaked lithic artifacts were recovered from this site. During excavation, a field sample was selected from each feature. There were 777 items in the sample. The rest of the specimens are stored for possible future analysis. The 777 specimens were examined to see if any of the edges were utilized

The lithic material was first sorted into flakes and debitage (flakes had a bulb of percussion, a platform and most often a feather termination; debitage had none of the above characteristics but were "chunks" of material). Once separated, the flakes and

debitage were checked for material type, modification of shape, presence or absence of cortex, unifacial or bifacial use, retouching, size (there were four size categories used: 0-2cm, 2-4cm, 4-10cm, and greater than 10cm), number of edges utilized, and type of use.

Of the 777 specimens examined, 28% (221) were found to have been utilized as tools. Of these, 72% were flakes and 28% weredebitage.

The majority (56%) of the material used was siliceous. The remaining attributes that were examined will be discussed in terms of the majority for both flakes anddebitage. Much of this siliceous material is banded rhyolite, while the rest may be either very dense siliceous limestones or siltstone. Usually, the material was very fine grained. Colors ranged from black to bluish grey, light grey, creamish and green. Chert is the next most common (38%) material type. It occurs in a variety of colors. Chalcedony and quartzite are used only occasionally (0.9% and 4% respectively). No obsidian was found at this site.

Only 3% of these tools were modified (modified is used here to mean further shaping of the original flake ordebitage shape into another shape such as a knife blade, spoke-shave graver, thumbnail scraper, etc.). The rest (97%) of the tools remained in the original flake ordebitage shape.

75% of the tools were flakes ordebitage with the cortex still present. In many instances, the cortex was used as backing.

Only 14% of the tools showed bifacial use. The remainder (86%) of the tools showed only unifacial use. It should be noted here that the term unifacial was not restricted to use on only one surface, but rather included use found directly on the edge as well.

Only 6% of these tools had retouching scars present on the surface. The majority (56.5%) of these tools are 2-4cm in length. The next largest category (23.9%) is 0-2cm in length; 4-10cm or more represented only 19.6% of the total. No flaked lithic artifacts found were over 10cm in size.

The type of use found was due predominantly to light scraping and cutting activities. The wear was usually directly on the edge and slightly unifacial. Except in a few cases, the damage on any surface extended no more than 1.5mm from the edge. Flake scars resulted from use. These were small, parallel and scalar in shape. Polishing and edge rounding were frequent. Usually a small portion of the edge was broken from use. Use occurred most frequently on one edge (64.7%) followed by two edges (28.0%) and finally more than two edges (7.2%). Those tools with use on more than two edges were scraping/cutting tools.

From the data it appears that siliceous flakes were used most often on one edge in a scraping or cutting manner. The high frequency of cortex present, little flake modification, and use on one edge suggests that these people required just a sharp edge for many of their daily activities, instead of a modified tool. There was no doubt

use of both manufactured and naturally flaked lithic materials.

The tremendous amount of flaked lithic debris on the site suggests that when one tool edge became dull it was an easy matter to acquire another sharp edge. Most of the tools examined appeared only to have been utilized a few times and discarded for a sharper edge.

Retouch Flakes -- Twenty-six retouch flakes were recovered from this site. Twenty-one of these flakes are chert; four are siliceous, and one is quartzite. These twenty-six retouch flakes hardly reflect the large assemblage of bifacially flaked tools. If the bifacial tools were manufactured at this site, the excavation did not uncover the area of manufacture.

Cores -- Six cores (one utilized as a scraper and the other a hammerstone) were recovered from the excavation. Four of these cores are of a siliceous material and the remaining two are chert. As was the case with the Retouch Flakes, these six cores do not account for the large number of flakes recovered. Where the remainder of the cores are is still unknown.

OTHER ARTIFACTS

Ceramic Polishers -- Nine ceramic polishers were recovered from this site. These are all siliceous pebbles ranging in size from 2cm. to 5cm. across the largest diameter. All of the pebbles are smoothed and polished and five of the pebbles have striations from use. Several of the pebbles also show slight battering use. All but one ceramic polisher was found in General Fill. The polisher found at Floor Contact was in Feature 7.

Stone Palettes -- One stone palette was found. The material utilized for this palette appears to be tabular shale or limestone. This palette is 15cm long by 10cm wide by 6mm thick. The palette surfaces have not been smoothed but were left bumpy. One surface of the palette has powdered limonite on it, while the other has powdered hematite. This stone palette was found in the Floor Fill in the Adobe Structure.

Shaft-Polishers (Barnett 1973) -- Four Shaft-Polishers were recovered and examined. The first of these is trapezoidal and has been ground on all surfaces and ridges. The ends are broken. The base measures 7cm long by 8.9cm wide. It is 5.1cm from the base to the apex. There is one highly polished groove at the apex 5cm long and 1.3cm wide. It is not apparent whether this was first a ground stone object and later a shaft-polisher or if the shaft-polisher was fashioned to this trapezoidal shape originally.

The second shaft-polisher is triangular and ground partially

on several surfaces and edges. This shaft-polisher is not nearly as finished as the first one, being made from a large pebble. The base measures 5cm long by 7.6cm wide and 3.2cm tall from the base to the apex. The polished groove is at the apex, but it has been fractured, making measurements of size difficult.

The third shaft-polisher is a broken, loaf-shaped rectangular 2 hand mano. All surfaces have been ground. This piece is 16.5cm long by 10.2cm wide and 8.9cm tall from the base to the apex. The groove at the apex is 7.6cm long and a tapering 3.8cm wide. This groove is not particularly deep or highly polished. This shaft-polisher has been partially burned.

The fourth shaft-polisher is triangular and ground on all edges and surfaces. The edges also have been battered. The base measures 7.6cm long by 5.1cm wide and 2.5cm from base to apex. There is a highly polished groove at the apex, measuring 2.5cm long and a tapering 1.3cm wide. There is red pigment on the base of this shaft-polisher.

One of the shaft polishers was found on the Surface, two in General Fill, and one at the Sterile Level in the Adobe Structure

The first three shaft-polishers are of an igneous material, while the fourth is siliceous. The small size of these four polishers suggests that they were portable tools, easily moved when needed.

The shaft-polishers described above are all essentially ground to a triangular shape. This was perhaps the most useful shape

for these shaft-polishers. Due to the fragmentary nature of these shaft-polishers it is impossible to tell whether more than one groove was originally present.

Mortars -- One mortar of igneous rock was found set in gypsum plaster on the floor of the Outside Living Surface. The total outside measurement of the grinding unit (including plaster base) was 36cm square. The outside measurement of the mortar itself is 35.6cm by 25.4cm. The thickness at the lip ranges from 7.6cm to 8.9cm. The depth of the mortar hole is 11.4cm. The inside diameter of the mortar holes at the lip measures 17.8cm, tapering to 3.8cm at the bottom of the hole.

Pestles -- Three pestles were recorded from this excavation. The first of these is a green igneous pestle 14.6cm long. This pestle has been fractured at the middle into two pieces. The circumference at the base measures 22.8cm. This tapers to 7.6cm at the tip. The pestle has been evenly ground into a conical shape. Battering marks from use occur at both the base and tip. Flakes scars produced from use also appear at the base. The interior underside of the base is indented and red powdered pigment was found there. This pestle was found in the General Fill in Feature 19.

The second pestle is also made of an igneous material. Although it is essentially a conical triangle, there are four distinct surfaces and edges. The surfaces are all ground and several of the edges battered, particularly that edge which encircles the base. Both the base and tip are rounded and show battering wear

as would be expected from grinding and/or pounding activities. This pestle measures 6 inches long 27.9 cm at the circumference of the base and tapers to 12.7 cm at the tip. This pestle was found on the floor in Feature 5.

The third pestle is one that is felt by Southward to have also doubled as a 2-4 hand mano. This pestle is also of an igneous material and measures 44.5 cm long. The pestle is essentially triangular with three flat surfaces and three edges. The surface and edges have been ground. The edges as well as the tip and base also show wear from pounding or grinding. The circumference at the base is 33 cm. This widens to a central bulge measuring 36.8 cm and then the pestle tapers to a tip 12.7 cm in circumference. One side and base of the pestle have been burned at one time. This pestle was found on the floor of the Outside Living Surface in Feature 5.

Schist Shaft -- One green schist shaft was recovered from this excavation. The schist shaft is broken into 4 separate pieces. Length of the shaft is 61.6 cm. The breaks are very clean and even with little attrition as if the bar was either intentionally broken or remained in place where it was broken. The circumference at the base is 15.2 cm. This tapers only slightly over the length until it reaches the tip where it decreases considerably to a 8.3 cm circumference. The shaft is very smooth and exceptionally well made. The underneath side of the base has



PHOTO 23. Schist Shaft

been ground to form an indentation. Slight striations are apparent over the entire length of the bar. These appear to be due to manufacture rather than use. The tip is slightly battered. Due to the extremely fragile nature of schist and the amount of time required for the manufacture of such a shaft it seems unlikely that the tip was

used to grind or pound. The battering may have resulted from something being pecked upon the tip. This schist shaft was found near the burial in Feature 21.

Wedges -- One stone wedge of a siliceous material was found. This wedge measures 15.2cm long. The circumference at the top of the wedge measures 12.7cm which tapers to a 8.9cm circumference at the tip. The wedge measures 1.9cm at its thickest and tapers to .9cm at the tip. The top of the wedge is flat and slightly battered. The bottom tip has been chipped to form a wedge shape and sharp edge. The tip edge has been battered from use. This wedge was found in the General Fill of the Adobe Structure.

Mineral Specimens -- Several different mineral specimens were found at this site. Approximately 136 pieces of selenite were recovered. What, if any, use they served remains unknown. Gypsum is very abundant in this area and the naturally occurring selenite may have been just another local "rock".

Two quartz crystals were found. The first of these is perfectly clear and is 23mm long. The base circumference is 6mm and tapers to 3mm at the tip. Both the base and tip are broken.

The second quartz crystal is milky and measures 48mm long. This crystal is 23mm at the widest circumference. Both the base and tip are broken.

Both crystals were found in General Fill, the first from Feature 5 and the second from Feature 6.

Three small pieces of limonite and one of hematite were found.

These pigments were undoubtedly used to mix paints. Two small pieces of copper sulfate were also found. These chunks, when scratched, powder very easily and it may be that they were also used to form some decorative paint. All these pigments were found in General Fill.

One fossilized brachiopod was recovered from the General Fill in Feature 13.

Shell -- Fifty-five pieces of shell were recovered from this excavation. These shell pieces have not yet been analyzed, but there seem to be 4 olivella shells and the rest are bits and pieces of mother of pearl. Thirteen pieces of shell had drilled holes. Of these, many were pendants, but only four remained intact. One of these pendants is a fish (Photo 24).



PHOTO 24. Shell Fish Pendant

At least half of the 55 pieces of shell were shaped or ground in some way including the pendants mentioned above (Photo 25).

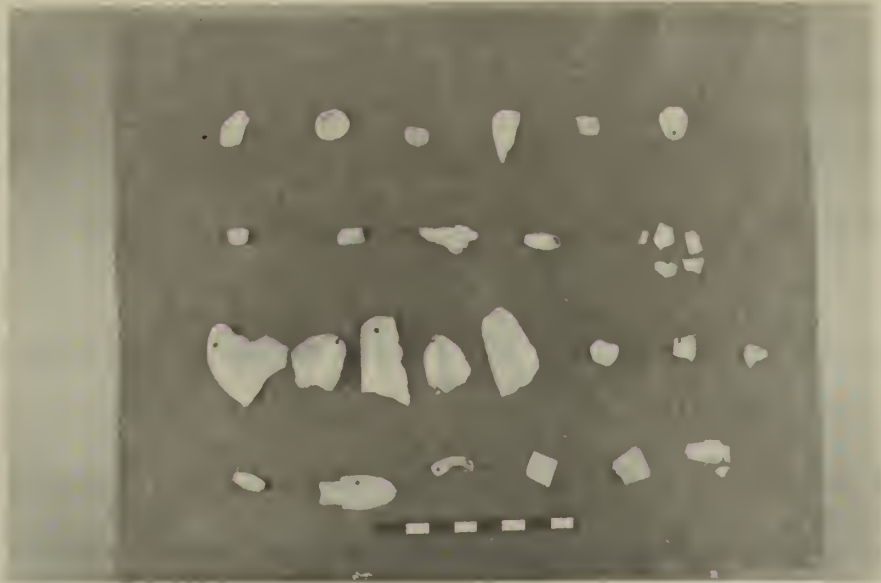


PHOTO 25. Shell Artifacts

The rest were probably being stored for future use as decorative items or for trade.

Only two pieces of shell were found in Floor Fill in the Adobe Structure. The rest were all found in General Fill.

Hammerstones -- Thirteen hammerstones were found. Three of the hammerstones are of an igneous material and the remaining ten are of siliceous materials such as rhyolites or cherts. These hammerstones range from one-hand fist size to those that would require two hands for use. All the edges show battering and some flake removal due to use. Only three of the hammerstones were found at Floor contact, discovered in Features 3 and 6.

Perishables - No antler, bone or basketry artifacts were recovered from this site.

SUBSISTENCE

LA 4921 is located at an elevation of 5000 feet. This happens to be the elevation which Bailey (1913) uses to divide the Lower and Upper Sonoran life zones. The lower portion is treeless and exhibits a desert grass and sagebrush cover. The upper portion is one of pinyon - juniper forest cover. A few miles up the slopes of Sierra Blanca, from 7000 to 9500 feet, is the Transition Zone, characterized by yellow pine forest. Above this is the Canadian Zone of spruce and fir forest. The prehistoric people living at LA 4921 would thus have been able to exploit four Life and Crop Zones without venturing very far from their village.

It is unfortunate that at the time this paper is being written we have not been able to have any of the faunal or floral remains identified. We were able to identify corn cobs from the excavation, and a number of rodent and rabbit bones. Without this analysis we can only speculate on the dietary habits of these people.

The large number and variety of projectile points suggest that hunting was still an important means of supplying protein. Of the big game animals deer and antelope were primary trophies, while others such as sheep, elk, or bear might have been taken. Probably smaller game were more often acquired through either hunting or trapping. These would include rabbit, squirrels, skunks, porcupines, and others. Some avian species were pro-

bably hunted including quail, duck, doves and turkey (which may also have been domesticated). Fish, amphibians and reptiles could have been a food source that would be more difficult to identify because of the greater decalcification of the bone material.

Wild food plants most often found in sites in the Jornada area include oak acorns, pinon nuts, yucca fruits, mesquite beans, cactus 'tuna', lamb's quarters, and wild strawberries. In addition to these foods, various wild seeds were collected and ground into flour. Other wild fruits, greens, and vegetables were collected seasonally. This may have fostered a kind of limited nomadism that required a portion of the village to seasonally travel to other areas to exploit a valuable food resource.

There are a number of lists of flora and fauna found in this area or at sites in this area. There is a very good list of mammals and avian species compiled by Jack Cully in the HSR Technical Manual (1973). Vorsila Bohrer has a tentative list of utilized plant remains from Fresnal Shelter (HSR 1973). Heller and Ford have recently published faunal and ethnobotanical information in The Smokey Bear Ruin (Wiseman et al 1976). Kelley (1966) is a good source of organic resources for the Sierra Blanca area.

SOCIAL ORGANIZATION

Archaeologists have always speculated on the social organization of the ancient people they study, as did the antiquarians and philosophers who preceeded them. However, it is difficult to demonstrate social organization from artifactual remains. Recently, some archaeologists have attempted to develop techniques for the identification of aspects of social organization which go beyond speculation (see Longacre 1964; Hill 1970). These techniques have not proven completely successful, but they represent attempts to go beyond the traditional descriptive presentations.

Because of the small sample of structures and artifacts from LA 4921, and because the research plan centered on locating, excavating, and stabilizing structures, it is impossible to do more than speculate about the social organization of the village.

The social organization of a society consists of the social arrangements and relationships of human beings in a society. It may be broken down into its component institutions for study, or it may be considered as a single functioning system. To a certain extent, the complexity of any particular society is limited by the subsistence base and the complexity of the existing technology (for a more exhaustive discussion, see Engels 1884; White 1959; and Smith 1976). There is also a tendency to regard a social system as primarily a result of adaptation to the local

environment (see Martin and Plog 1973).

With a more extensive excavation and a larger budget, we might profitably deal with the question of the nature of social organization and attempt to identify aspects of the social organization at this site. Under the circumstances, however, we can only present limited conjectures on a few aspects.

POLITICAL ORGANIZATION

We assume that the inhabitants of LA 4921 lived at the tribal level. Tribes typically are egalitarian societies supported by herding or simple horticulture or agriculture. Political and personal status is established in part by position within a family and in part by personal qualifications. There are no great distinctions in material wealth in the society (for a fuller discussion and examples, see Service 1958 and Cohen and Middleton 1967).

Evidence gathered at LA 4921 indicates that it is a large site for the area, but small when compared to other parts of the Southwest. The scanty evidence we have from architecture and burials does not indicate any great difference in material possessions within the community. In short, there is no evidence for a complex political organization.

POPULATION AND RESIDENCE PATTERNS

Population size in prehistoric sites is usually estimated by multiplying the number of rooms or floor area by a constant. At LA 4921, we did not excavate enough structures or identify enough unexcavated structures to attempt such an estimate. The field party felt, as a subjective opinion, that the site may have supported as many as 200 people at any one time.

Residence patterns are another area where little can be said. It would be possible to suggest that the single-room structure was occupied by a nuclear family or an extended family consisting of a couple with their parents and children, while the multiple-room structure was an "apartment house" for an extended family or a joint family consisting of a group of sisters (or brothers) and their spouses. We could then assume, as we have elsewhere in this report, that the single-room structure is earlier, and move to a discussion of shifts in residence patterns and family organization. However, in order to support such arguments, we would need considerably more evidence than we have available.

IDEOLOGY

The ideological component of the social organization of LA 4921 is represented only by isolated objects. Using other prehistoric Southwestern groups as models, we can assume that one or more community religious structures exist on the site, but none were found during this project.

The isolated objects which were or may have been components of the ideological system include the burials and the objects included with them, the schist bar, possibly the shell fish, and other such items.

The Schaafsma's (1974) have suggested that the nearby petroglyphs may have been important in a socio-religious sense. They suggest that the petroglyphs were part of a larger cult in the desert area which was later assimilated by the Pueblo cultures. If this is the case, our inventory of ideological items is increased considerably, since many of the petroglyphs are pottery designs.

INTERPRETIVE PLAN

The purpose of this plan is to present to the visitor of the site a basic understanding of the way of life of the people who lived there. It will cover, in a simplified form, their social organization, living environment, technology and subsistence. This section will be divided into three parts. The first will cover the prehistory of the area and the site and can be used in the preparation of a pamphlet that could be made available to visitors. The second section will contain the interpretive signs and legends to be placed along the trail. The third section will deal with the presentation and display of artifacts.

Overview

The earliest humans that we have good evidence for in the Three Rivers area are the Folsom hunters, who lived and hunted in the plains west of this valley about 10,000 years ago. In surrounding areas, there is evidence that they preferred to hunt large herd animals, such as buffalo, and it is probable that they hunted similar animals here. The Folsom hunters were exploiting the last of the great Pleistocene game herds and seem to have ranged over wide territories in their hunting.

As the large Pleistocene animals became extinct, the wide-ranging hunters were replaced by groups who hunted modern animals and gathered modern plants. These hunters and gatherers seem to

have lived in more restricted territories than the earlier hunters, and probably used every food resource in the area. Modern hunters and gatherers do not live in permanent villages, but camp near food sources and move as they run out of food in each area. This period of hunters and gatherers, called the Archaic Stage by archaeologists, began as early as 7000 B.C. in some places and was dominant all over North America by 5000 B.C. In the Far West this way of life lasted until contact with Europeans.

Domesticated corn is found in New Mexico as early as 2300 B.C., but farming as a way of life did not begin until about 300 B.C. The earliest farmers in the state were in southwestern New Mexico. As these early New Mexicans became farmers, they lived in permanent villages with communal religious structures and began making pottery. Their major crops were beans, corn and squash. They probably adopted this lifestyle from villages further south in Mexico.

The Archaic peoples of the Three Rivers area did not immediately adopt farming, but continued hunting and gathering. The presently accepted estimated date for the introduction of farming into the area is A.D. 900, but future work will probably show that farming was actually adopted earlier than that.

Archaeologists call the prehistoric farmers of Southeastern New Mexico the Jornada Mogollon (hor-NAH-da muggy-OWN). We do not know as much about the Jornada Mogollon in the Three Rivers area as we do in other places. Some of the statements made below

will need to be changed as more sites are dug.

In the earliest period (Capitan Phase) the Jornada Mogollon lived in pit houses with the floor dug into the ground. The pit houses may have been the homes of single families. Even though they were farmers, much of their food may have come from hunting and from wild plants. Their basic pottery was a crude brownware which was sometimes decorated with red or black paint. They also made a smooth tan or terracotta decorated pottery with broad-line designs painted in red paint. Late in the period, some painted pottery was imported from the Rio Grande or even as far west as Arizona.

In the next period (the Three Rivers Phase), pit houses were still used, but people were beginning to build houses on the surface of the ground. These houses were made of adobe or stone and usually have several rooms. At the Three Rivers Site, the people seem to have combined the two kinds of houses and built "surface" houses in the pits. Some archaeologists believe that the new surface houses were not the homes of single families. They believe that the houses were the homes of groups of relatives, such as a group of sisters and their husbands and children. There was not enough money available in 1976 to dig enough of the site to test this idea.

In this period the Jornada Mogollon made more kinds of pottery and imported pottery from further away. The most common pottery was still plain brown, but there was also a decorated

version with both red and black paint (El Paso Polychrome). The terracotta pottery was still made, but the painted lines were narrower and the designs were more complicated. There are more kinds of imported pottery than there were in the early period. Some of the pottery came from as far away as eastern Arizona.

In the last period (San Andres Phase), villages were larger and more complex . Villages seem to have had several houses built around a plaza. The new village arrangement may mean that there was a stronger political organization, or it may have just been a new style. Locally made pottery was about the same as for the middle period, except that they also began making a red pottery decorated with black paint. Imported pottery from central and western New Mexico, eastern Arizona and northern Mexico has been found.

Archaeologists do not know what happened to the Jornada Mogollon. They seem to disappear about A.D. 1400. Some archaeologists believe that they moved away, possibly going north to the east of Socorro, New Mexico.

The Site

This village was first settled about A.D. 900. The people built and lived in pit houses similar to the one on the interpretive trail. The village was small and although the people farmed along the river they were still dependent on hunting and gathering wild plant foods. The center of the village was

located west of the excavated and reconstructed area; the excavated area was not occupied in the early period. As the people became better farmers, the village expanded east along the river and they became less dependent on hunting and gathering.

The excavated portion of the site was settled at about A.D. 1200. At this time, the villagers were building houses like the masonry structure; they are more like surface houses but are still slightly below the ground. The benches between the site and the river were farmed at this time. Trade became more important; local pottery, Three Rivers Red-on-Terracotta, was exported and shell was brought in from the Gulf of Mexico and the Pacific Ocean. The petroglyphs on the hills to the northwest were made at about this time.

By A.D. 1250, the village had grown to an important position in the Tularosa Basin. There was trade in goods and ideas from a large part of the Southwest and even from Mexico. The people started to build in the Pueblo style. The adobe structure is a good early example. Many and varied drawings of ceremonial masks at the petroglyph area reflect the acceptance of Mexican religious ideas.

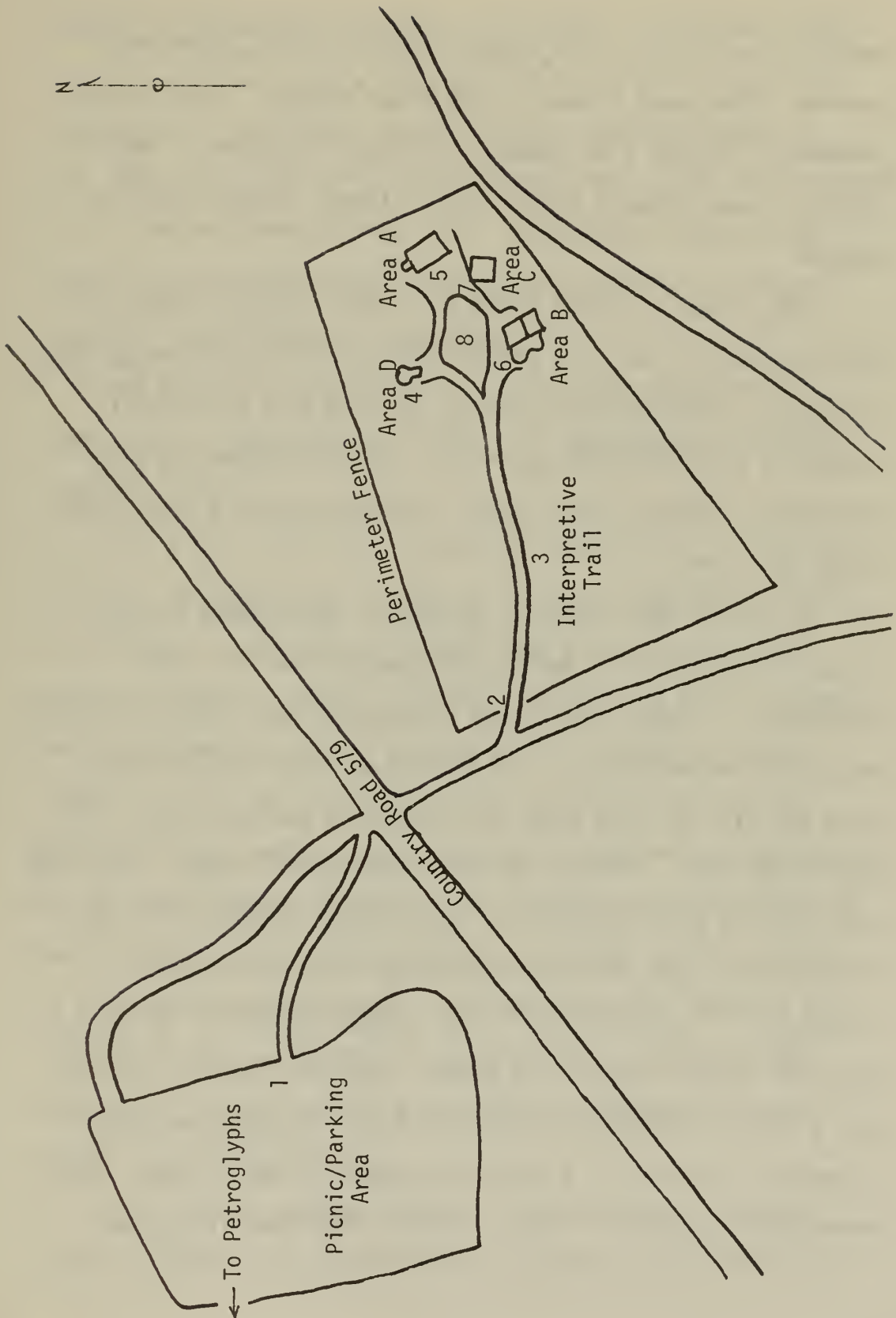
The village reached its greatest development at about A.D. 1300, but it was not able to maintain its existence for long. By A.D. 1350, the village had diminished in size and influence; by 1400 the village was abandoned.

Interpretive Signs

1. The first sign should be located at the picnic/parking area, it should describe the site and show its location with a map. The text might read as follows: "Between this area and the river is a prehistoric Indian Village. This trail leads to a portion of it which has been excavated and reconstructed (see Map 4).

The earliest people in the Three Rivers area were Folsom hunters, who lived and hunted in the plains west of this valley 10,000 years ago. These big game hunters were exploiting the last of the great Pleistocene game herds and ranged over wide territories in their hunting. As the large Pleistocene animals became extinct, the wide-ranging hunters were replaced by groups who hunted modern animals and gathered modern plants. These hunters and gatherers did not live in permanent villages but camped near food sources. They moved seasonally to areas where wild crops were ripening and where animals could be found. This period of hunters and gatherers, called the Archaic Stage by archaeologists, began as early as 7000 B.C. in some places and was dominant all over North America by 5000 B.C. In the Far West this way of life lasted until contact with Europeans.

Domesticated corn is found in the Southwest as early as 2300 B.C., but farming as a way of life did not begin until about 300 B.C. and later. The earliest farmers in the state were in the south-



MAP 4. Interpretive Signs.

western New Mexico. Their major crops were corns, beans and squash. They began to make simple brown pottery. They lived in permanent villages with communal religious structures. Their lifestyle was probably adopted from villages further south in Mexico.

The village at Three Rivers was first settled at about A.D. 900 by people we call the Jornada Mogollon (hor-NAH-da-muggy-OWN). These early settlers were farmers, but they were still partly dependent on hunting and gathering. They hunted deer in the mountains, antelope on the plains and collected wild plant foods along the river.

2. The second sign should be located at the entrance to the site, it should have a smaller scale map of the trail and structures. A small note on the sign should call attention to the datum and the necessity of not picking up any of the artifacts from the site (or this might be included on the next sign). The text might read: "You are now in a prehistoric village. Time and the elements have reduced it to its present condition. If you look carefully you may see the outline of the prehistoric structures. The older part of the village extends to the west; here the people lived in pit houses. The trail you will follow has a typical pithouse constructed on it. The other excavated structures are part of a later development of the village. They were settled about A.D. 1200. At this time, the village was

growing to an important position in this area. There was trade in goods and ideas from a large part of the Southwest and even from Mexico. The village reached its greatest development by A.D. 1300, after which the village diminished in size and influence. The village was abandoned by 1400. The Indians living in the area today are the Mescalero Apache, who arrived in this region long after the village was abandoned.

The metal disc stamped LA 4921 is an archaeological reference point identifying this site. All measurements are taken from this point."

3. This sign is optional, it might be interesting for visitors to notice an unexcavated structure, to see if they can identify its features. This would also be a good place to warn people about the damage of pothunting (this structure is badly potted) and of the importance (and legality) of not removing artifacts from the site. The text might read: "These are the remains of a multi-room pueblo. It has not been excavated professionally, but has been damaged by pothunters. Because excavations take so much scientific skill and knowledge, and cannot be done properly by a person without training, there are laws which prohibit digging in any ruin on federal or state property without written permission from the secretary of the bureau concerned, or the appropriate state authority.

This is a big outdoor museum. The ruins, rocks, plants, animals and even the broken pieces of pottery are its exhibits.

Therefore, please leave everything where you find it. Take nothing home but pictures and leave nothing but footprints."

4. This sign should be placed on the left hand (or west) side of the pit house. It should show a cut away drawing of the pit house. The text might read: "The earliest inhabitants of this site lived in structures similar to this. This pit house is a reproduction of a dwelling common to this area 1000 years ago. The great mass of the structure helped keep it warm in the winter and cool in the summer; the fireplace on the inside could be used for heating or cooking. An animal hide might have served as a door. It is thought that this is the seasonal or perhaps year-round residence of a single family. The people who lived here were farmers, but they depended on hunting and the gathering of wild foods for a good part of their diet."

5. This sign should be placed in front of the masonry structure. It should show a cut away illustration of the masonry structure and its roof structure. The text might read: "This structure is a pit house just like the last; it is later and more complex. The floor and walls are cut into a pure gypsum stratum. The roof of this structure was constructed in the same way as that of the pit house. Notice the thick and sturdy walls. The roof extended into the last course of stone. The compartment at the north end is a storage bin, where corn or other harvested crops were stored for the winter. The doorway was on the south with a step to help you enter. It is not very large; the people were small, the men averaging 5'4" tall and the women about 5'. The doorway

is small to help keep the rooms warm and for structural soundness. It may have been covered with a blind made of reeds or peeled willows. This structure was probably the residence of a single family.

The normal ground surface height in prehistoric times was one to two feet lower than it is today."

6. This sign should be placed in front of the adobe structure. It should show a floor plan of the structure to include the unexcavated rooms. The text might read: "This 'pueblo' (PWEB-low) contains a number of connected rooms, only three of which have been excavated. A fourth extends to the south and a fifth to the west. Normally, a single family occupied one room, using it as kitchen, living room and bedroom. The adjoining room may have been used for storage. There is not much space, but the inhabitants had no furniture and conducted most of their activities outside. Room interiors served mainly for protection during bad weather, or for sleeping. Beds consisted of pallets or mats placed on the floor. Two burials were found beneath these floors. It was the custom to bury the dead in this manner."

7. If necessary, another sign or possibly a small display case and bench could be placed in the area between the masonry structure and the adobe structure to add additional insights on the village; possibly concerning the fields on the benches between the site and the river, or about hunting in the mountains. It should cover resources available in the mountains (beams, chert, grinding stone

material etc.) and along the river (clay, tules, willows, stone, etc.). It could also cover those trade items brought into the area such as paint, shell, pottery, etc.

8. Smaller signs could identify modern vegetation and tell what could be eaten or utilized by the prehistoric people.

mesquite

prosopis juliflora

cholla cactus

cylindropuntia

prickley pear cactus

platyopuntia

yucca

yucca elata

four-wing saltbush

atriplex canescens

creosote bush

larrea tridentata

Artifact Display

In addition to the interpretive trail, the structures, and the pamphlet, it will be important to show visitors to the site some of the smaller, portable artifacts. Manos and metates should be returned to the site. They could be protected by drilling the base with a star drill and then epoxing in a section of rebar. They in turn could be set in post holes filled with cement in favorable locations in the structures.

It may be possible to laminate some of the smaller artifacts (such as arrowheads, drills, pottery sherds and shell remains) in plastic and attach these to the interpretive signs along the trail.

Some of the finer artifacts will be exhibited in a portable display case. This display may become part of a permanent visitors center at a later date. The case will contain:

- bifacially flaked tools (such as arrowheads and drills)
- a polished shist bar tool
- pottery sherds and a restored vessel
- shell beads and pendants
- a ground stone mano
- plant remains (such as mesquite beans).

CONCLUSIONS

Two structures, one group of storage pits and one living surface, were excavated. Two structures were stabilized and reconstructed, and one structure was constructed. An interpretive trail system was developed. Through this effort we have been able to make minor contributions to the knowledge of Southwestern Prehistory in this area. We have formally defined a new pottery type: Jornada Red. We have examined a new architectural type: a rectangular masonry wall pit structure. As is common, we have managed to raise more questions than we answered.

One fascinating question is whether Chupadero B/W is a locally made type rather than intrusive. It is unfortunate there were not sufficient funds to analyze any of the faunal or floral remains, or to secure Carbon 14 or tree-ring dates. Future work should include the completion of the excavation of the adobe structure and additional magnetometer work. Additional work should also attempt to gather more information of the whole site and relate it to the entire Three Rivers drainage.

From the point of view of recreation and research archaeology, this is but the first chapter. It has been a small project with limited objectives. The project cannot be regarded as finished. This is but the first phase in the study

of LA 4921 and the developing of a recreation area. Additional work will answer many questions about the prehistoric inhabitants of this village and complete the development of an interesting and educational exhibit for recreational purposes.

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APPENDICES

- I. MAGNETIC SURVEYING by Tony Preslar
- II. INHUMATIONS by Glenn Hicks
- III. MASONRISEAL INFORMATION

APPENDIX I
MAGNETIC SURVEYING AT THREE RIVERS

by Tony Preslar

Magnetic surveying using a portable proton precession magnetometer was employed at the Three Rivers Archaeological Project to delineate sub-surface archaeological features. The following were found:

- (1) One storage pit
- (2) One adobe wall
- (3) One room of a semi subterranean adobe pueblo.

None of these features were visible on the surface. The Three Rivers area proved to be an excellent area for magnetic surveying. Background magnetic noise was low, and magnetic responses associated with archaeological features were prominent.

The survey technique included optimization of the sensor height, correction for the diurnal variation of the magnetic field of the earth, and a 30 centimeter profile station spacing. The sensor height was optimized by profile station spacing. The sensor height was optimized by profiling an area with four different sensor heights, and selecting the sensor height which minimized background magnetic noise and maximized magnetic effects that could be associated with archaeological features. The optimum sensor height was .31 meters. The Three Rivers optimum sensor height determination data is presented in the data set. Corrections were made for the diurnal variation of the magnetic field

of the earth by repeating magnetometer readings at specified control stations. These corrections were quite small (approximately 4 gammas). A station spacing of 30 centimeters was used so that good resolution could be obtained. Good resolution allows non-symmetrical and symmetrical magnetic anomalies to be differentiated. Symmetrical magnetic anomalies are generally associated with geological effects. These generalizations will be true only for areas of low background magnetic noise.

The magnetic responses of the archaeological features found are shown in a series of east-west and north-south magnetic profiles. The features are numbered as follows:

Feature 1 - storage pit.

Feature 2 - rock (geological anomaly)

Feature 3 - adobe wall

Feature 4 - pueblo room

The geological anomaly, feature 2, is noted so that its nonsymmetrical response can be compared to the symmetrical responses of the archaeological features. The high-low magnetic response dissimilar from the low magnetic response of the archaeological features. The two criteria were used to differentiate archaeological features from geological effects.

The magnetic response of the archaeological features is caused by magnetic susceptibility differences between soil types. The storage pit and pueblo room were filled with midden surrounded by gypsum which produced a measurable magnetic susceptibility

from the surrounding gypsum, producing the magnetic effect observed.

Magnetic surveying over archaeological sites can yield satisfactory results given the right geological conditions. The

Three Rivers area certainly satisfies these requirements. Any future archaeological projects in the Three Rivers area should include magnetic surveying in the research design.

ILLUSTRATION 24
 THREE RIVERS OPTIMUM SENSOR HEIGHT DETERMINATION DATA
 MAGNETIC PROFILES USING 4 DIFFERENT SENSOR HEIGHTS
 (1) 0.15 M
 (2) 0.31 M
 (3) 0.46 M
 (4) 0.61 M

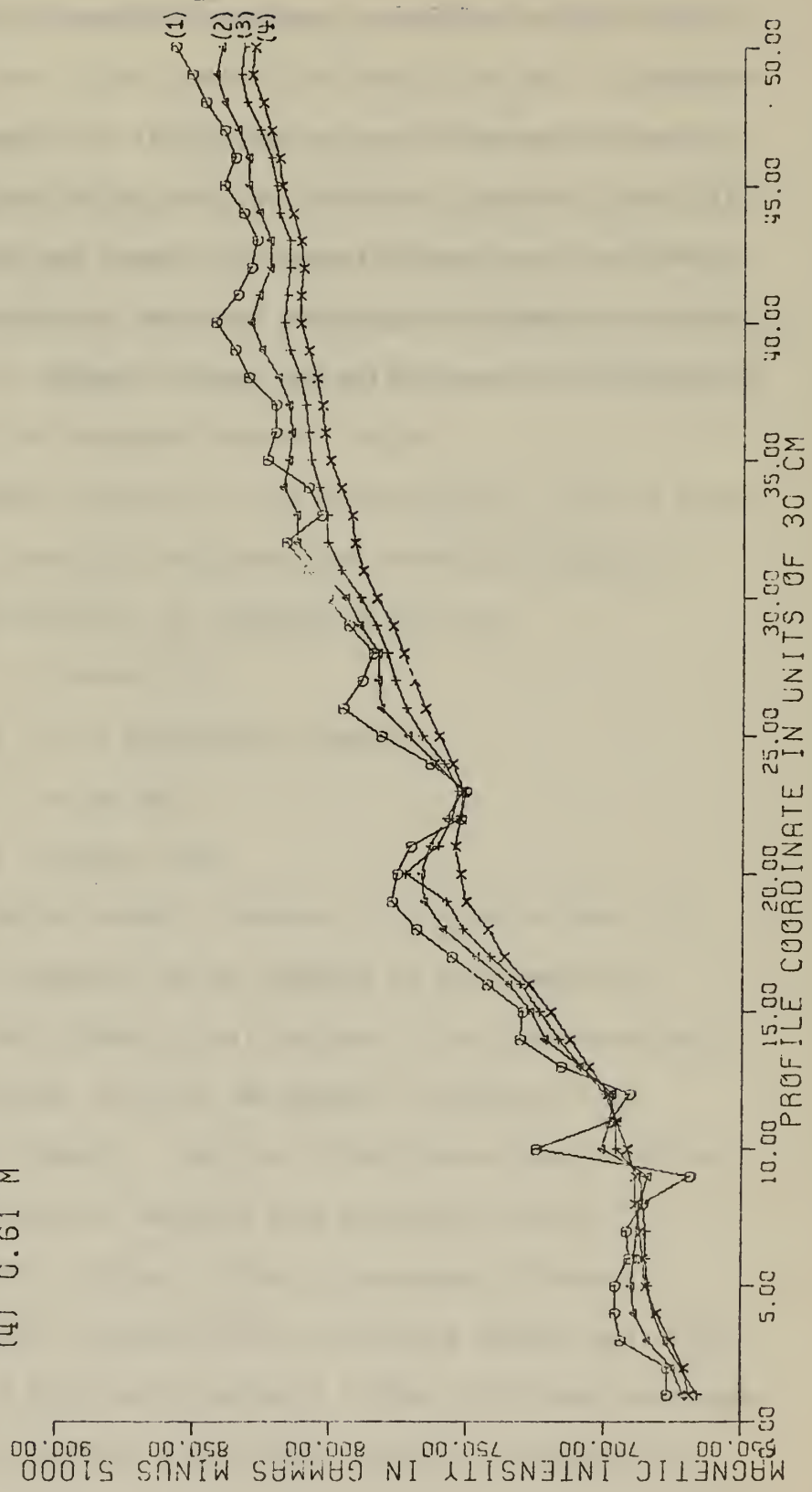


ILLUSTRATION 25
NORTH-SOUTH MAGNETIC PROFILE FEATURE 1 AND 2

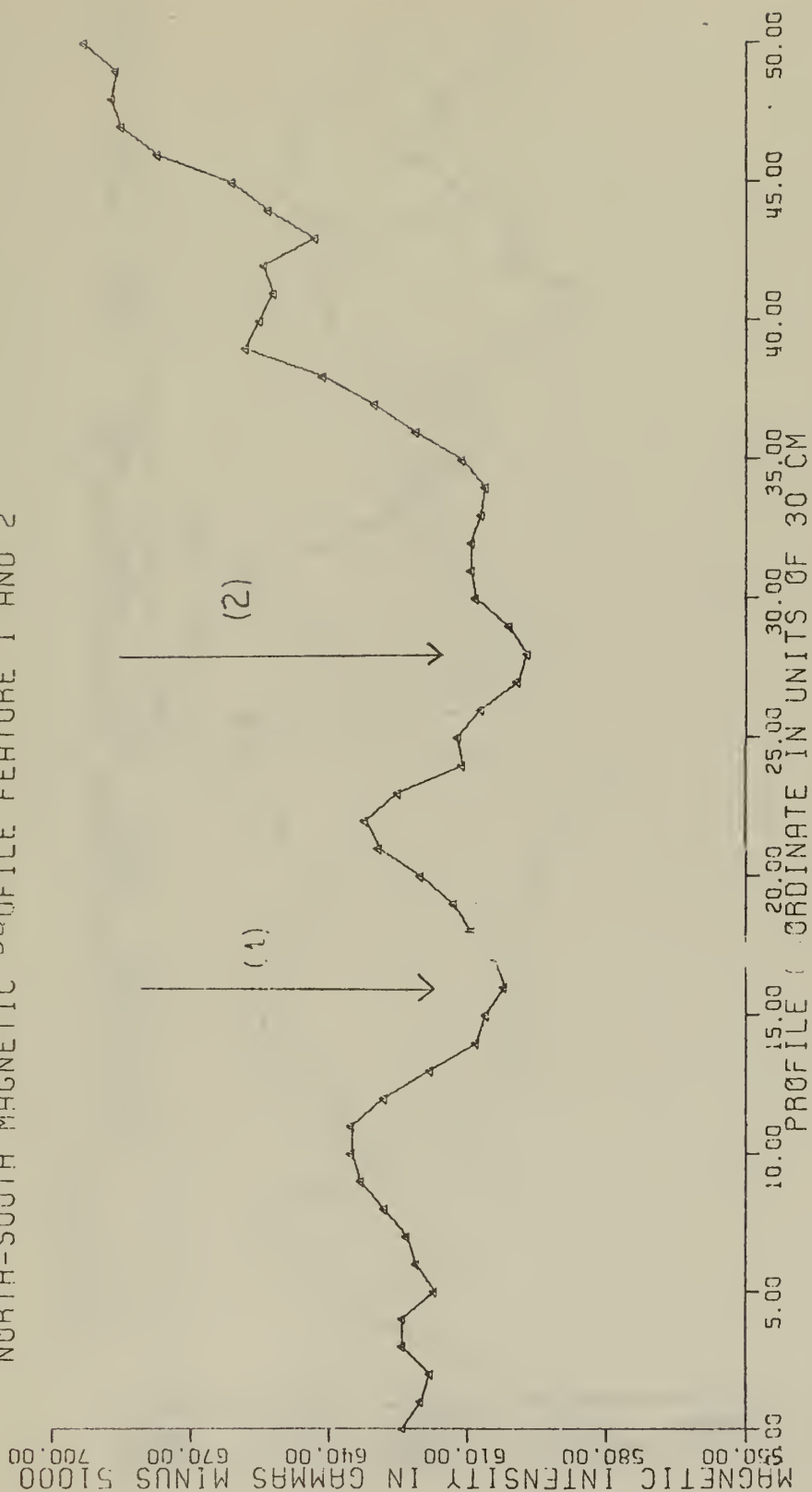


ILLUSTRATION 26
EAST-WEST MAGNETIC PROFILE FEATURE 1

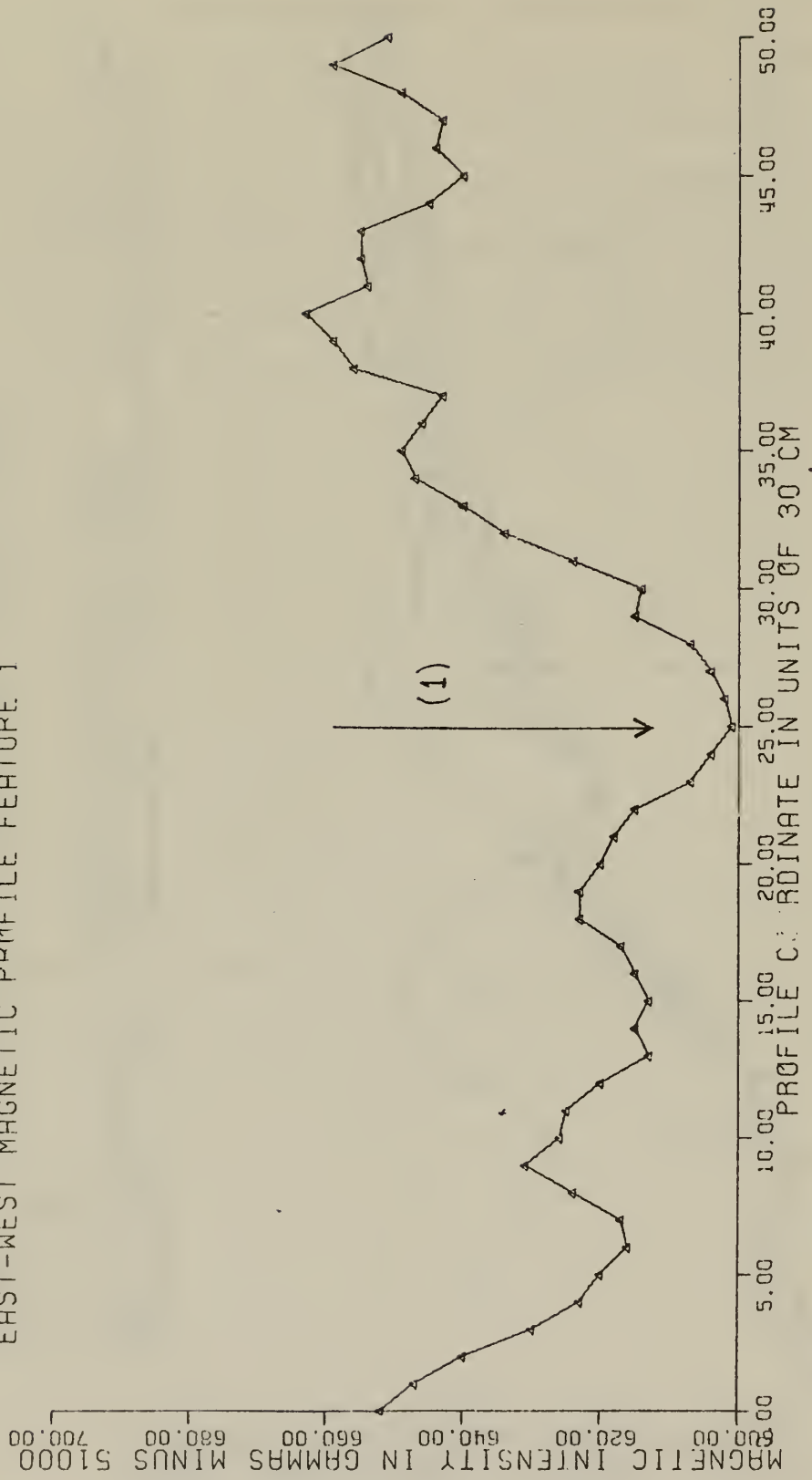


ILLUSTRATION 27
EAST-WEST MAGNETIC PROFILE FEATURE 2

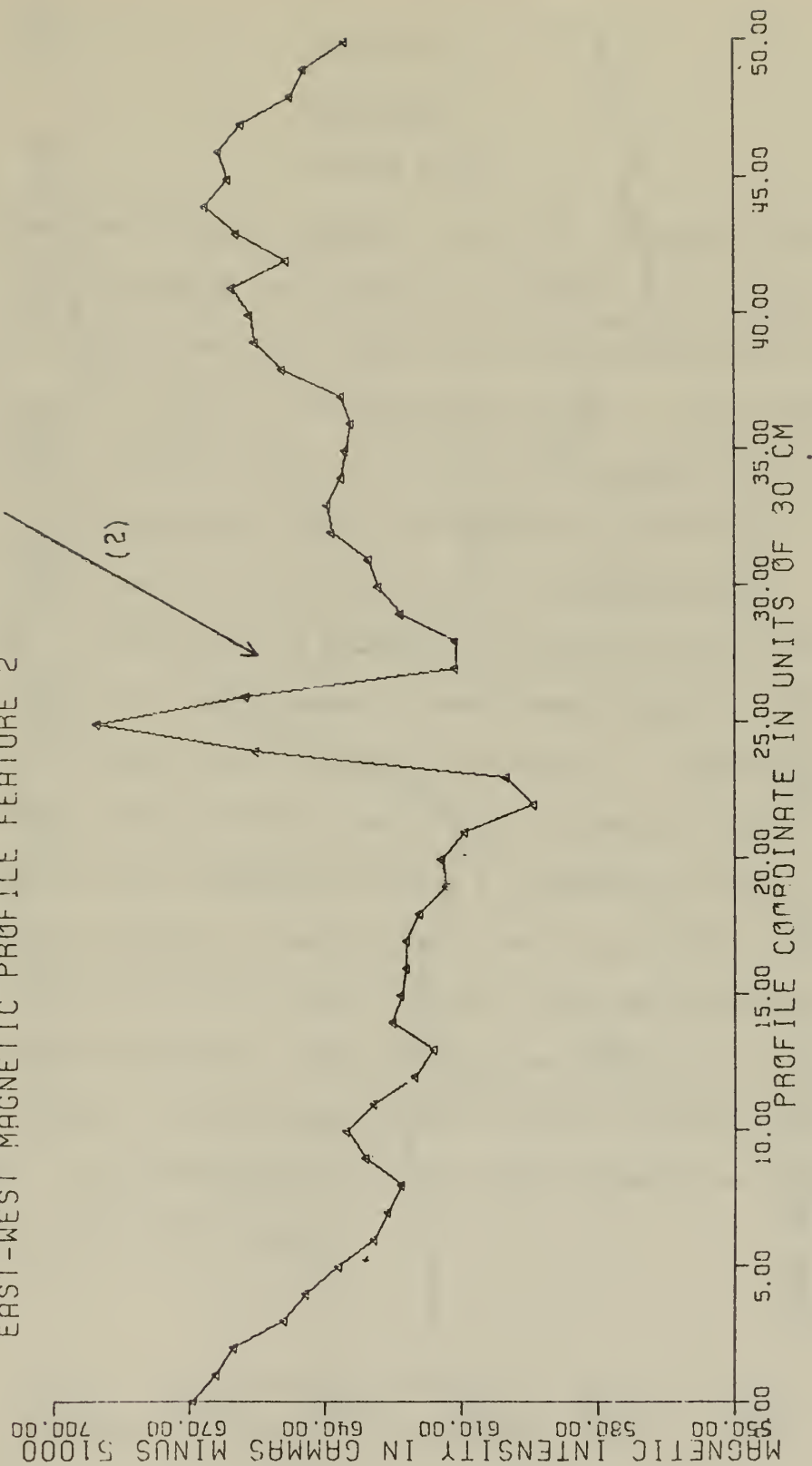
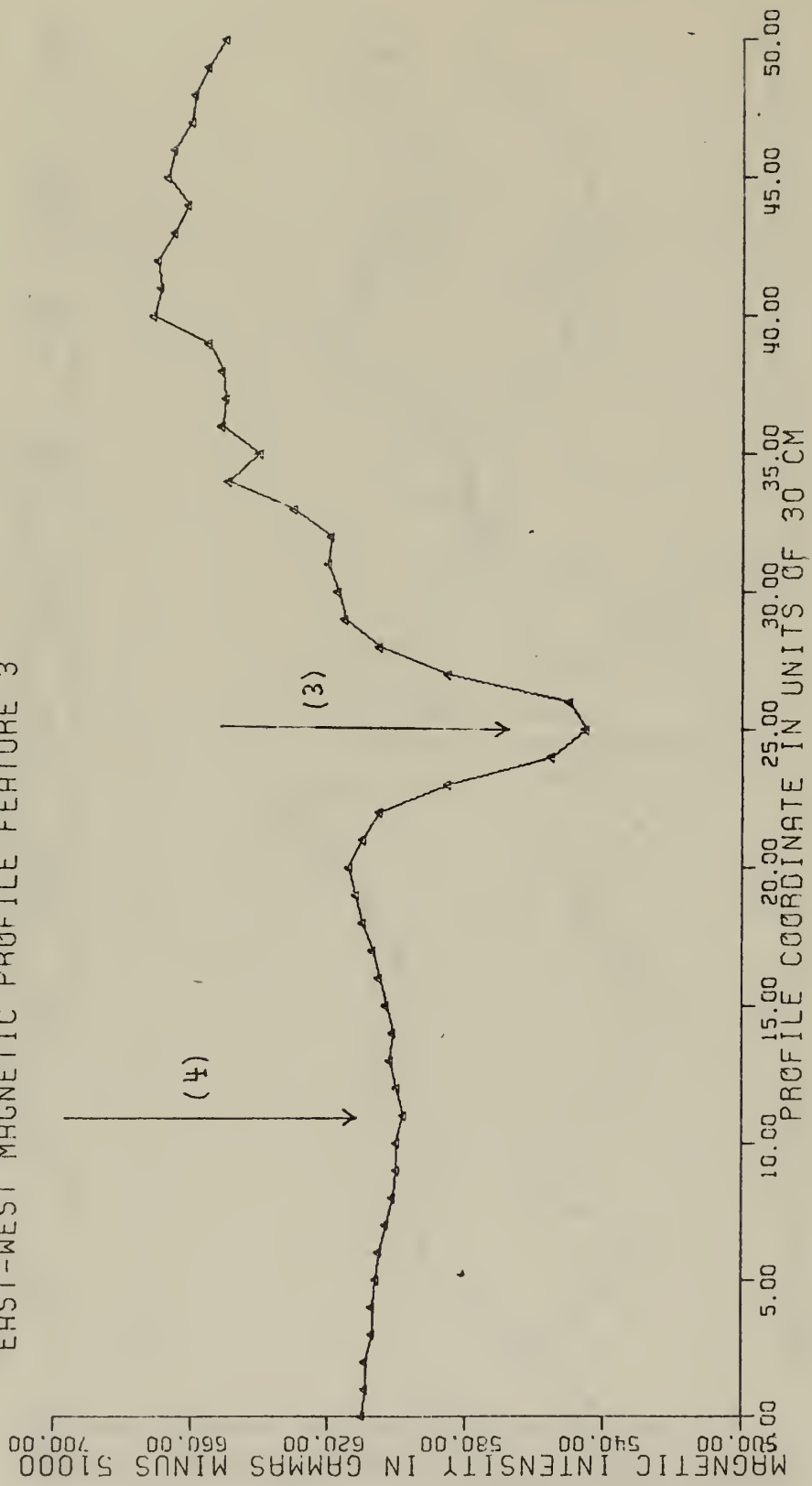


ILLUSTRATION 28
EAST-WEST MAGNETIC PROFILE FEATURE 3



APPENDIX II

INHUMATIONS

by Glenn Hicks

Three burials were recovered. The first, Specimen #15 was found at the bottom of the storage pit. Photo 9 in the architectural section shows the location where the skeleton was found. The schist bar (Photo 23) was immediately above it. This specimen consists of a partial skull, the proximal end and head of one femur, and miscellaneous chips. The specimen was too badly decomposed to be of any analytic value. The second burial, Specimen #61 was found in a hallowed out section of the north wall of the contiguous pit room. It was found covered by a Three Rivers Red-on-Terracotta bowl, see Photo 17 . Specimen #61 is the partial skeleton of an infant 18-24 months of age. It consists of two fragmentary femurs; a fragmentary fibula; a fragmentary humerus; a complete left clavicle measuring 9.2cm.; and the distal end of the right clavicle. Eight deciduous teeth were found in association: two incisors, two canines, four molars upper and lower first and second molars. None of the roots had ossified. Also some small skull and pelvic fragments and miscellaneous chips were recovered.

This is by far the most complete skeleton recovered at the site. It is a male, mid-late thirties. All parts are represented except: the innominate bones; a few vertabrae; the sacrum and coccyx; and a few ribs. All epyphesial unions are complete.

Cranium: The entire rear area of the skull is missing from just posterior to the foramen magnum to the crown of the head. Gone are most of both parietals and the greatest portion of the occipital. The face has a low retreating forehead with prominent brow ridges and squarish orbits. The zygomatic arches are extended onto the temporal bone as well defined crests past the external auditory meatus. The mastoid processes are rather large and massive, and the specimen has quite a broad palate. Sutural closure is nearly complete endocranially, and well advanced ectocranially, with some small wormian bones present. The frontal bone and the intact portions of the parietals display a very coarse texture.

Mandible: Of less than moderate stoutness with a squarish appearance and prominent chin.

Dentition: All 32 teeth had fully erupted but not all were present for examination. Extremely advanced tooth wear on all teeth. All showed irregular wear with no cusp pattern visible on any of the molars and the incisors and canines show flat to angular wear on all occlusal surfaces. Caries, with one extremely deep cavity in the PM² and M¹ area on the left. Pre-mortem loss of right M₁ and M₂ with complete resorption by the mandible.

Spine and Pelvis: Entire pelvic area as well as the sacrum and coccyx are missing except for a small fragment of an iliac blade. Vertabrae present were: cervical no. 1, thoracic no. 6-12, lumbar no. 1-5.

Sternum: A complete manubrium and corpus sterni were recovered. They were not fused. Manubrium measured 4.85cm. in length, corpus sterni 10.98cm. in length.

Clavicles and Scapulae: Two complete clavicles of normal size and stoutness were recovered as well as a complete left scapula and fragments of the right.

Bones of the Arms and Legs: All bones were recovered, however, only the radii were wholly intact. (see table)

TABLE 1: CRANIOMETRIC MEASUREMENTS (All data is for Specimen #68)

Maximum length	---
Maximum breadth	---
Minimum breadth	9.34cm.
Total facial ht.	12.12cm.
Total facial inde	87.44cm.
Upper facial ht.	7.46cm.
Upper facial inde	53.82cm.
Bizygomatic breadth	13.86cm.
Nasal ht.	4.94cm.
Nasal breadth	2.54cm.
Nasal index	51.42cm.
Left orbit ht.	3.6cm.
Right orbit ht.	3.67cm.
Left orbit breadth	4.1cm.
Right orbit breadth	3.8cm.
Orbital index *	87.80cm.
Maxillo-alveolar leng.	5.2cm.
Maxillo-alveolar brth.	6.53cm.
Maxillo-alveolar ind.	126.50cm.
Palatal length	4.42cm.
Palatal breadth	4.03cm.
Palatal index	91.17cm.

*Left side measurements were used as standards.

TABLE 2: MANDIBLE

Bicondylar breadth	12.14cm
Bigonial breadth	10.09cm.
Ht. of ascending ramus	5.49cm.
Ht. of symphesis	3.48cm.

TABLE 3: OTHER BONES

Clavicle length	R 16.14cm.
	L 16.20cm.
Clavicular robustness index	22.84cm.
Humerus length**	R 33.00cm.
	L 34.20cm.
Claviculo-humeral index *	47.37cm.
Radius length	R 25.80cm.
	L 25.70cm.
Reconstructed stature (using the above figures, indices from Genoves, 1967)	161.28cm. 5ft. 3in. - 5ft. 4in.

* Left side used as standard

** Estimates based on Muller's formula cited in Krogman, 1962:179

APPENDIX III

MASONRISEAL WATER REPELLENT INFORMATION

Application - Masonriseal may be applied at temperatures above freezing, on dry clean surfaces with any device that completely saturates the surface to the point of run-off, but preferably with a spray at pressures not to exceed 5 pounds per square inch. Do not apply when temperatures fall below 32°F. before curing (24 to 48 hours). After curing, the test surface will absorb little, if any, additional solution. Avoid high winds. If spray is deposited accidentally on windows, wash off at once with sponges and water. Also, do not apply when solution may be diluted by rain or sprinkler before curing. Work from bottom to top of vertical surfaces, so that run-off will saturate the surface previously covered.

Solution - Masonriseal is mixed with water in various ratios depending upon the conditions.

For Masonry (Vertical Surfaces) - 1 part concentrate to 32 parts water for burnt adobe, adobe bricks, slump block, stucco, adobe walls, etc.

(Horizontal Surfaces) - 1 part concentrate to 25 parts water. Apply with mop and avoid leaving a surplus on the surface.

For Wood

- 1 part concentrate to 25 parts
water.

Longevity - Special additives and lower viscosity insure deeper penetration and sub-surface protection. Tests show penetration of adobe up to $\frac{1}{4}$ inch when application is properly made, thus providing protection from the elements.

Handling and Storage - Masonriseal is stored and shipped in concentrate form. The solvent (water) is usually available at the job site and need not be stored or transported to make the solution. This eliminates the need for bulky, heavy drums. One pint of concentrate makes three to four gallons of solution, depending upon conditions, and a small amount of Masonriseal provides enough solution for a days work. Masonriseal is safer to store and handle than petroleum products. It is not flammable.

Coverage - Depends upon absorption of surface being treated. Apply to point of run-off -- in general, 100 square feet per gallon of solution.

Price - Less expensive than competitive products. Prices furnished upon request.

Graves Industries
4642 East Don Jose Drive
Tucson, Arizona 85718
(602) 299-1661

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